CATALOGUE.

MINERALOGY.

A. PHYSICAL CHARACTERS OF MINERALS.

1. STRUCTURE AND IMITATIVE SHAPES.
2. PSEUDOMORPHISM.
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9. TASTE AND ODOUR.
10. ELECTRICITY AND MAGNETISM.

B. CHEMICAL CHARACTERS OF MINERALS.

1. FUSIBILITY.

GOVERNMENT CENTRAL MUSEUM,
MADRAS.

BY ORDER OF THE GOVERNMENT

OF

MADRAS.

Price 1½ *Rupee.*

MADRAS:
Printed at the Military Male Orphan Asylum Press, Mount Road.

1855.

CATALOGUE

OF THE

GOVERNMENT CENTRAL MUSEUM,

MADRAS.

ARRANGED AND COMPILED

BY

EDWARD BALFOUR, Esq., Surgeon, Madras Army,

OFFICER IN CHARGE.

PHYSICAL AND CHEMICAL CHARACTERS

OF

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MINERALOGY.

A. PHYSICAL CHARACTERS OF MINERALS.

MINERALS

TO ILLUSTRATE

STRUCTURE AND IMITATIVE SHAPES.

(Columnar, texture.)

No. 1. CARBONATE OF LIME. *(Phill).*
KALKSPATH. CALCIT. *(Haid).*
CHAUX CARBONATEE. *(Haüy).*
from Töplitz, Bohemia.

(Columnar, texture.)

No. 2. RED IRON ORE.
ROTOHEISENSTEIN.
FER OLIGISTE: *Hæmatite.*
from Tilkerode in the Hartz.

(Divergent-Columnar, Radiated.)

No. 3. GRAY OXIDE of MANGANESE.
MANGANIT. *(Haid).* GRAU-BRAUNSTEIN *(Hausm).*
ACERDESE. *(Beud).*
from Ihlefeld in the Hartz.

(Concentric Columnar.)

No. 4. COMMON QUARTZ.
GEMEINER QUARZ.
from the Fragrathal, Tyrol.

(In long fibres.)

No. 5. RED IRON ORE, HAEMATITE.
ROTHEISENSTEIN.
FER OLIGISTE.
from Frgang, Bohemia.

(Fibrous.)

No. 6. FIBROUS GYPSUM.
FASRIGER GYPS.
CHAUX SULFATEE FIBREUSE.
from Rüdersdorf near Berlin.

(In very thin fibres.)

No. 7. COMMON ASBESTUS.
ASBEST. *(Werner).*
ASBEST' DUR.
from Greiner in the Tyrol.

(Reticulated, or net-like.)

No. 8. TIN WHITE COBALT. *(Phillips).*
SPEISKOBALT *(Werner).* SMALTIN *(Haid).*
COBALT ARSENICAL. *(Haüy).*
from Schneeberg in Saxony.

(Stellated, or star-like.)

No. 9. WAVELLITE. *(Jameson).*
WEAVELIT. *(Werner).*
ALUMINE PHOSPHATEE. *(Haüy).*
from Zbirow near Beraun, Bohemia.

(Lamellar.)

No. 10. MICA.
MUSCOVITE. *(Dana).*
ZWEIAXIGER GLIMMER.
from Tennville in Transylvania.

(Coarse grained.)

No. 11. CARBONATE of LIME. *(Phill).*
KALKSPATH. CALCIT. *(Haid).*
CHAUX CARBONATEE. *(Haüy).*
from Targas Finland.

(Granular.)

No. 12. GRANULAR LIMESTONE.
KORNIGER KALK.
CALCAIRE SACCHAROIDE.
from Carrara.

(Curved Conchoidal, with radiated texture.)

No. 13. LAMELLAR HEAVY-SPAR. *(Jameson).*
KRUMMSCHALIGER SCHWERSPATH. *(Werner).*
BARYTE SULFATEE CRISTALLISEE. *(Hy).*
from Freiberg.

(Curved Conchoidal.)

No. 14. IRON MICA.
EISENGLIMMER.
FER OLIGISTE ECAILLEUX.
from Sala, Sweden.

(Crystalline, Conchoidal.)

No. 15. TUNGSTATE of IRON. *(Phillips).*
WOLFRAM. *(Werner).*
SCHEELIN FERRUGINEUX.
(Haüy).
from Zinnwald in Bohemia.

(Scaly.)

No. 16. LEPIDOCROKIT. *(Ullmann).*
from Herdorf near Siegen.

(Compact.)

No. 17. COMPACT HEAVY-SPAR. *(Jameson).*
DICHTER SCHWERSPATH. *(Werner).*
BARYTE SULFATEE COMPACTE.

(Globular.)

No. 18. AGATE.
ACHAT.
from Tefeld Harz.

(Knobby.)

No. 19. MENILIT.
QUARTZ RESINITE. *(Leberopal.*
from Menil Montant, near Paris.

(Botryoidal.)

No. 20. RED IRON-ORE. *(Jameson).*
ROTHEISENSTEIN. *(Werner).*
FER OLIGISTE. *(Haüy).*
from Eibenstock in Saxony.

(In joined globules.)

No. 21. PISIFORM LIMESTONE.
ERBSENSTEIN. *(Werner).*
CHAUX CONCRETIONEE CARB.
(Globuliforme).
from Carlsbad.

(Oolitic.)

No. 22. CLAY IRON STONE.
THONEISENSTEIN.
FER OXYDE ARGILIFERE.
from Aalen, Wurtemberg.

(Lentil shaped.)

No. 23. CLAY IRON STONE.
THONEISENSTEIN.
FER OXYDE ARGILIFERE.
from Radnitz, Bohemia.

(Reniform.)

No. 24. BLACK MANGANESE ORE. (*Jam*).
HARTMANGANERZ.
MANGANESE OXYDE.
from Langeberg near Schwarzenberg.

(Stalactitic).

No. 25. FIBROUS BROWN HEMATITE.
FASRIGER BRAUNEISENSTEIN.
LIMONITE FIBREUSE.
from Lobenstein in the Russias.

(Shrub shaped.)

No. 26. ARRAGONITE.
EISENBLUTHE. (*Werner*).
FLOSFERRI.
from Eisenerz in Steyermark.

(Acicular.)

No. 27. NEEDLE ZEOLITE.
MESOTYPSPATH-NATROLITH in Klingstein.
ZEOLITE EN AIGUILLES.
from Aussig in Bohemia.

(Forming plates.)

No. 28. OCTOHEDRAL COPPER.
GEDIGEN KUPFER.
CUIVRE NATIF.
from Rheinbrietbadh.

(Cellular.)

No. 29. RADIATED PYRITES.
STRAHLKIES. (*W.*)
PYRITE RAYONNEE (*Brochant*).
from Bodenmait, Bavaria.

(Porous.)

No. 30. GLASSY-PUMICE. (*Jameson*).
BIMSTEIN.
LAVE VITREUSE PUMICEE.
from the Volcano. (*Lapari Island*).

(Drusy.)

No. 31. NEEDLE ZEOLITE.
NADEL-MESOTYP in Basalt.
ZEOLITHE in Aiguilles.
from Linz, Rhine.

(Drusy.)

No. 32. TOADSTONE.
MANDELSTEIN with Zeolite.
PIERRE AMYGDALOIDE.
from Kaiserstahl in Baden.

(Drusy.)

No. 33. TOADSTONE.
MANDELSTEIN, with green earth and zeolites.
PIERRE AMYGDALOIDE.
from Far Oer.

(Marbled.)

No. 34. OTTRELITE IN CLAY SLATE.
KIESEL-THON-EISENOXYD.
MANGANOXYD. WASSER.
from Ottrez in Limburg.

(Marbled.)

No. 35. ARENACEOUS LEAD ORE.
MINE DE PLOMB ARENACE.
BLEISANDERZ. KNOTENERZ.
from Commern in the Eifel.

(Forming a thin cover.)

No. 36. CHROMATE OF LEAD. (*Phill*).
ROTHBLEIERZ. KALLOCHROM. (*Hausur*).
PLOMB CHROMATE. (*Haüy*).
from Beresowsk in the Ural.

(Polished by nature.)

No. 37. TIN WHITE COBALT. (*Phillips*).
SPEISKOBALT.
SMALTIN. (*Haid*). (*Werner*).
COBALT ARSENICAL. (*Haüy*).
from Schneeberg in Saxony.

(Flowery leaved.)

No. 38. PRISMATIC FELSPAR. (*Jameson*).
FELDSPATH (*W.*) ORTHOKLAS. (*Breith*).
ORTHOSE. (*Beud*).
from Brietenbrunn Saxony.

(With corroded surface.)

No. 39. BASALTIC HORNBLENDE.
BASALTISCHE HORNBLENDE. (*Werner*).
AMPHIBOLE BASALTIQUE.
from Schima in Bohemia.

(Flowered.)

No. 40. GALENA.
BLEIGLANZ. (*Werner*).
GALENE ; PLOMB SULFURE. (*Hauy*).
from Freiberg in Saxony.

CRYSTALLOGRAPHY.

THE regular forms assumed by minerals are well known under the name of crystals, and the part of mineralogy which refers to it is thence called CRYSTALLOGRAPHY, or a description of Crystals. Each substance usually exhibits a peculiar crystalline form of its own, although occasionally the same substance crystallises in two distinct and incompatible forms, in which case it is said to be *dimorphous*, from *(dis)* twice and *(morphé)* form. Some times also two substances are found having the same crystalline form and they are then said to be isomorphous, from (isos) like and (morphe) form.

Pseudo-morphism (*pseudos*, false, *morphé*, form,) or the occurrence of a mineral in a form not its own, and not obtained by the regular process of crystallisation, occurs in various minerals, and is chiefly owing to external conditions which have limited the direction and extent of the development of the mineral.

MINERALS

TO ILLUSTRATE

PSEUDOMORPHISM.

No. 1, TIN STONE, in the form of felspar.
from St. Agnes, Cornwall.

No. 2. CARBONATE OF LIME, in the form of Gay Lassite.
from Sangerhausen, Thuringia.

No. 3. GYPSUM, in the form of Rock Salt.
from Gossling, Upper Austria.

(Assuming the form of Nepheline.)

No. 4. LIEBENERIT, (*Stotter*) in *Porphyry.*
from Predazzo in Tyrol.

No. 5. STEATITE, (taking the form of Spinel).
from the Monzoni in South-Tyrol.

(Assuming the form of Iolite : syn : Dichroite.)

No. 6. CHLOROPHYLLITE. (*Jackson*).
from Kuddam, Connecticut.

(Assuming the form of Red Copper Ore.)

No. 7. MALACHITE.
from Chessy near Lyons.

No. 8. SERPENTINE, in the form of Felspar.
from Tredazzo, Tyrol.

No. 9. QUARTZ, in the form of Fluor Spar.
from Breonde, Department of the Haute Loire.

No. 10. HORNSTONE, in the form of Calcite.
from Schneeberg, Saxony.

No. 11. SANDSTONE, in the form of Rock salt.
from Geoolstein, Eifel.

No. 12. HEMATITE, in the form of Pyrites.
from the Spitzleite in Erzgebirge.

No. 13. QUARTZ, in the form of Barytes.
from Toplitz Bohemia.

(With impressions of Barytes.)

No. 14. IRON-PYRITES.
from Tavistock in Devonshire.

(Passing into Mica.)

No. 15. PRISMATIC ANDALUSITE. (*Jameson*).
from Lisenz in Tyrol.

(Decomposed to brown Iron Ore.)

No. 16. HEXAHEDRAL IRON-PYRITES. (*Jameson*).
from Beresowsk, Ural.

No. 17. QUARTZ, in the form of Anhydrite.
from Geyer, Saxony.

(Assuming the form of Pyroxene.)

No. 18. GREEN-EARTH.
from the val di Fassa in Tyrol.

No. 19. CARBONATE OF LIME, in the form of Felspar.
from Mamback, Thuringia.

No. 20. QUARTZ, covering crystals of heavy spar.
from Tavistock Devonshire.

MINERALS

TO ILLUSTRATE

TWIN CRYSTALS.

In their primitive forms crystals never present re-entering angles,—but such appearances are not unfrequent when two or more crystals grow as it were out of one base. Sometimes there is a certain degree of symmetry in the way in which individuals of a group collect themselves together, as in the crop-like form, usually assumed by the mineral called staurotide, and usually Twin Crystals as such cases are sometimes called, called also 'macles,' exhibit distinct marks of their origin.

TWIN CRYSTALS.

No. 1. AUGITE. (*Jameson*).
GEMEINER AUGIT. (*Werner*).
PYROXENE. (*Haüy*).
from Schöna in Bohemia.

No. 2. SPHENE. (*Haüy*).
SPHEN (*Karsten*) ; TITANIT (*Klapr*).
from St. Gotthard.

No. 3. GYPSUM.
GYPS.
CHAUX SULFATEE.
from Girgenti, Sicily.

No. 4. CARBONATE OF LEAD.
WEISSBLEIERZ.
PLOMB CARBONATEE.
from Diepenlienchen near Aix la Chapelle.

No. 5. PYRAMIDO-PRISMATIC ZEOLITE. (*Jam*).
HARMOTOM, KREUTZSTEIN. (*Werner*).
PIERRE CRUCIFORME.
from Andreasberg in the Harz.

No. 6. LEVYNE. (*Brewster*).
from Leipa in Bohemia.

No. 7. TINSTONE.
ZINNSTEIN. (*Werner*).
ETAIN OXYDE. (*Haüy*).
from Schlackenwalde in Bohemia.

Twin faces (Miller.)

No. 8. PRISMATIC FELSPAR. (*Jameson*).
ADULAR. (*Werner*).
FELDSPATHE. (*Haüy*).
from St, Gotthardt,

No. 9. PRISMATIC FELSPATH. (*Jameson*).
FELDSPATH. (*W*) ORTHOKLAS. (*Breith*).
ORTHOSE. (*Beud*).
from Hirschberg in Silesia.

No. 10. MAGNETIC IRON.
MAGNETKISEN. (*Werner*).
FER OXYDULE.
from Greiner, Tyrol.

No. 11. CLEAVELANDITE.
ALBITE, TETARTIN.
from Shezing, Tyrol.

No. 12. PRISMATIC FELSPAR. (*Jameson*).
ADULAR. (*Werner*).
FELDSPATHE. (*Haüy*).
from St. Gotthardt.

MINERALS

TO ILLUSTRATE

AGGREGATION AND FRACTURE.

ALTHOUGH by proper management and a skilful hand, by splitting off parallel faces of various thickness or by removing edges or angles which may have replaced faces, it is possible to obtain an ultimate or primitive form of each crystal,—simple minerals are often so constructed and built up of like parts, aggregated as it is termed, as to appear in forms dissimilar to the ultimate or primitive crystals.

When a mineral breaks in a direction different from the cleavage planes it forms fracture surfaces, and the form of the fracture may be *conchoidal, even, uneven, smooth, splintery, hackly,* or *earthy.*

AGGREGATION.

(Rhombohedrons aggregated to globular.)

No. 1. CARBONATE OF LIME. *(Phill).*
KALKSPATH. CALCIT. *(Haid).*
CHAUX CARBONATEE. *(Haüy).*
from Maxen near Dresden.

(Rhombohedrons aggregated to skalene dodecahedrons.)

No. 2. CARBONATE OF LIME. *(Phill).*
KALKSPATH. CALCIT. *(Haid).*
CHAUX CARBONATEE. *(Haüy).*
from Freiberg in Saxony.

(Hexahedrons aggregated to dodecahedrons.)

No. 3. FLUOR SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Ehrenfriedersdorf, Saxony.

(On Orthoclase.)

No. 4. CLEAVELANDITE. *(Brooke).*
ALBIT.
TETARTIN. *(Breithaupt).*
from Hirschberg in Silesia.

(On orthoclase, in regular situation.)

No. 5. CLEAVELANDITE. *(Brooke).*
ALBIT.
TETARTIN. *(Breithaupt).*
from Hirschberg in Silesia.

(On Orthoclase.)

No. 6. CLEAVELANDITE. *(Brooke).*
ALBIT.
TETARTIN. *(Breithaupt).*
from Hirschberg in Silesia.

No. 7. GRANITE, GRAPHIC.
SCHRIFTGRANIT.
from Zweiesel, Bavaria.

(On Iron glance.)

No. 8. PRISMATO-PYRAMIDAL-TITANIUM ORE.
RUTIL.
TITANE OXYDE.
from St. Gothard.

(Joined with Starbide.)

No. 9. PRISMATIC KYANITE. (*Jameson*).
KYANIT. (*Werner*). KYANITH. (*Breith*).
DISTHENE. (*Haüy*).
from St. Gotthardt.

FRACTURE.

Very difficult to break by striking with a hammer.)

No. 10. OCTOHEDRAL COPPER.
GEDIEGEN KUPFER.
CUIVRE NATIF.
from Katherinenberg in the Ural.

(Very difficult to break by striking with a hammer.)

No. 11. NEPHRITE.
CERAUNITE.
JADE NEPHRITIQUE. (*Haüy*).
from China.

(Very difficult to break.)

No. 12. FIGURE-STONE, AXE STONE. (*James*).
BEILSTEIN. (*Werner*). BILDSTEIN.
TALC GLAPHIQUE.
from Ochsenkopf in Saxony.

(Very difficult to break by the strokes of a hammer.)

No. 13. COMMON ASBESTUS.
ASBEST GEMEINER.
from Sala, Sweden.

(Very difficult to break by the strokes of a hammer.)

No. 14. FIBROLITE. (*Bournon*).
FASERKIESEL.
from Bodenmais in Bavaria).

(Difficult to break.)

No. 15. BASALT.
OLIVIN UND TITANEISEN EINSCHTIESSEND.
from Unkel on the Rhine.

(Difficult to break.)

No. 16. MEERSCHAUM.
MAGN: CARB: SILICIF: SPONSIEUSE.
ECUME DE MER.
from Natalia.

(Less difficult to break.)

No. 17. HORNSTONE.
HORNSTEIN.
QUARTZ AGATE GROSSIER.
from Rugen.

(Easily broken.)

No. 18. SEMI-OPAL.
HALBOPAL.
from Bilin, Bohemia.

(Very easily broken.)

No. 19. PRISMATIC SULPHUR.
SOUFRE. *(Haüy).*
SCHWEFEL. NATURLICHER.
from Girgenti in Sicilia.

(Friable.)

No. 20. PORCELAIN-EARTH.
KAOLIN, PORZELLANERDE.
(Werner).
FELDSPATH DECOMPOSE.
(Haüy).
from Aue in Saxony.

(Flowing with difficulty.)

No. 21. BLACK MINERAL OIL. *(Jameson).*
THEERIGES ERDOL *(Werner)*
BITUME LIQUID NOIR *(Haüy)*
from Salso in Parma.

(Liquid.)

No. 22. YELLOW MINERAL OIL. *(Jame son).*
GELBES ERDOL. *(Werner).*
BITUME LIQUIDE JAUNE.
(Haüy)
from Miamo in Parma).

(Feeling rough.)

No. 23. TRIPOLI.
TRIPEL. *(Werner).*
from Meissen Berg near Prague.

(Feeling soft.)

No. 24. MYELIN. *(Breith).*
TALKSTEINMARK. *(Freiesleben).*
from Rochlitz in Saxony.

(Feeling greasy.)

No. 25. RHOMBOIDAL GRAPHITE.
GRAPHIT.
GRAPHITE.
from Ceylon.

(Feeling greasy.)

No. 26. AGALMATOLITE.
from Saczka, Banat.

(Dissolving in water.)

No. 27. FULLERS EARTH.
WALKERDE
TERRE A FOULON.
from Reifenstein near Cilly.

(Becoming translucent in water.)

No. 28. EHRENBERGIT. *(Nöggerath).*
from Drachenfels in the Siebengebirge.

(Writing.)

No. 29. ROTHEL. (CLAY MIXED WITH RED OXYD OF IRON).
from Eiberstock, Saxony.

(Writing.)

No. 30. BLACK CHALK.
from Osnabruck.

(Elastic.)

No. 31. MICA.
ZWEIAXIGER GLIMMER.
MUSCOVITE. *(Dana).*
from Miask in the Ural.

(Elastic.)

No. 32. Elastic bitumen.
Elatkrit. (*Hausmann*).
Bitume elastique. (*Haüy*).
from Castleton in Derby-shire.

(Elastic, sounding.)

No. 33. Gypsum.
Gyps,
Chaux Sulfatee.
from Montmartre near Paris.

(Ductile.)

No. 34. Hexahedral Silver-Glance. (*Jameson*).
Glaserz. (*Werner*). Silber-glanz. (*Breith*).
Argent Sulfure. (*Haüy*).
from Freiberg.

(Ductile.)

No. 35. Silver Horn-Ore. (*Jameson*).
Hornerz. (*Werner*).
Argent muriate. (*Haüy*).
from Cogniapo, Chile).

(Less Ductile.)

No. 36. Nontronit. (*Berthier*).
from Andreasberg in the Harz.

(Ductile.)

No. 37. Ozokerite. (*Glocker*).
Erdwachs.
from Slanik in Moldavia.

(Less Ductile.)

No. 38. Bitumen. (*Dana*).
Asphalt; Erdpech.
Bitume glutineux.
from Lobsan, Dpt. of the Bas-Rhin.

(Less Ductile.)

No. 39. Vitreous Copper. (*Jameson*).
Kupferglanz, Kupferglas. (*Werner*).
Cuivre Sulfure. (*Haüy*).

(Mild Sextile.)

No. 40. Galena. (*Phill*).
Bleiglanz. (*Werner*).
Plomb Sulfure. (*Haüy*).
from Freiberg, Saxony.

(Mild.)

No. 31. Steatite. (*Jameson*). Soap-stone.
Speckstein. (*Werner*). Stea-tit.
Talc steatite. (*Haüy*).
from Wunsiedel in Bavaria.

(Malleable.)

No. 42. Hexahedral Silver. (*Jameson*).
Gediegen Silber.
Argent natif. (*Haüy*).
from Schneeberg, Saxony.

(Flexible.)

No. 43. Axifrangible Gypsum. (*James*).
Frauenеis. (*Gyps*). (*Werner*).
Chaux Sulfatee. (*Haüy*).
from Eisleben.

(Brittle.)

No. 44. KEROLITE.
KEROLITH. (*Breith*). HYDROSILICIT. (*Kuh*).
from Frankenstein in Silesia.

(Weak.)

No. 45. ASPHALT.
BITUME SOLIDE.
from Merthyr Tydvill, Devon.

(Even fracture.)

No. 46. RIBBON JASPER.
BANDJASPIS.
JASPE RUBANE.
from Lerbach in the Harz.

(Even fracture.)

No. 47. COMMON SERPENTINE.
SERPENTIN.
OPHIOLITE.
from Reichenstein, Silesia.

(Even and Splintery.)

No. 48. HELIOTROPE.
HELIOTROP. (*Werner*).
QUARZ AGATHE PONCTUE.
from the East.

(Even fracture.)

No. 49. GALENA.
BLEISCHWEIF.
PLOMB SULFURE.
from Clausthal.

(Uneven fracture.)

No. 50. LEPTYNITE. (*Z. Th.*)
HORNFELS.
from Andreasberg in the Harz.

(Uneven and Splintery.)

No. 51. COMMON QUARTZ.
GEMEINER QUARZ.
from Freiberg, Saxony.

(Uneven fracture.)

No. 52. COMMON QUARTZ—FRESHWATER QUARTZ.
GEMEINER QUARZ.
from Muffindorf near Bonn, on the Rhine.

(Uneven fracture.)

No. 53. TRACHYTE.
TRACHYT.
from der Rosenau in the Siebengebirge.

(Uneven fracture.)

No. 54. PORCELAIN JASPER.
PORZELLAN-JASPIS. (*Werner*).
JASPE PORCELLAINE.
from Töplitz.

(Uneven fracture.)

No. 55. HEXAHEDRAL IRON-PYRITES. (*Jameson*).
SCHWEFELKIES. (*Werner*).
FER SULFURE. (*Haüy*).
from Traverrella, Piedmond.

(Splintery.)

No. 56. ALABASTER.
GESSO.
KORNIGER GYPS.
ALABATRE.
from Castellina in Tuscany.

(Splintery fracture.)

No. 57. ANHYDRITE. (*Jameson*).
ANHYDRIT DICHTER. (*Werner*).
CHAUX SULFATEE ANHYDRE. (*Hy*).
from Sulz in Neckar.

(Splintery.)

No. 58. COMMON SERPENTINE.
SERPENTIN.
OPHIOLITE.
from Pfanders, Tyrol.

(Splintery fracture.)

No. 59. COMPACT FELSPAR.
FELDSTEIN. ADINOLE. HALLEFLINTE.
PETROSILEX. (*Beud*).
from Sala Sweden.

(Splintery fracture.)

No. 60. HORNSTONE.
HORNSTEIN. (*Werner*).
QUARZ AGATHE GROSSIER.
from Frankenstein in Silesia.

(Splintery.)

No. 61. COMMON CALCEDONY.
CALZEDON.
CALCEDOINE.
from Oberstein.

(Splintery fracture inclining to Conchoidal.)

No. 62. COMMON QUARTZ.
GEMEINER QUARZ.
from Zinnwald, Bohemia.

(Conchoidal fracture.)

No. 63. HORNSTONE. (Brown Coal formation).
HORNSTEIN.
QUARTZ AGATE GROSSIER.
from Rolt near Bonn.

(Conchoidal fracture.)

No. 64. FLINT.
FEUERSTEIN.
SILEX PYROMAQUE.
from Schonen.

(Conchoidal fracture.)

No. 65. JASPER.
KUGELJASPIS.
JASPE.
from Kandern in Baden.

(Conchoidal fracture.)

No. 66. SEMI OPAL.
HALBOPAL.
from Königswinter on the Rhine.

(Conchoidal fracture.)

No. 67. OBSIDIAN. (*Werner*).
OBSIDIENNE.
from the Lipari Islands.

(Conchoidal fracture.)

No. 68. MAGNESITE. (*Jameson*).
MAGNESIT, TALKERDE. (*Werner*).
MAGNESIECARBONATE.(*Haüy*)
from Frankenstein in Silesia.

(Earthy fracture.)

No. 69. LITHOMARGE. (*Freiesleben.*)
STEINMARK. (*Werner*).
ARGILE LITHOMARGE. (*Haüy*).
from the Harz.

(Slaty.)

No. 70. DEVONIAN CLAY-SLATE.
THONSCHIEFER.
ARDOISE.
from Caub on the Rhine.

MINERALS

TO ILLUSTRATE

CLEAVAGE.

MINERALS are found to vary much in the degree of coherence existing among the various parts of which they consist,—and whilst some can with difficulty be broken, others yield to the slightest blow. Even in the same species cohesion varies in different directions and there are certain planes at right angles to which it seems to be at a minimum, so that the mineral separates along or parallel to these planes far more readily than in any other direction. This property is termed Cleavage, and the planes thus formed, Cleavage planes.

CLEAVAGE.

No. 1. FLUOR-SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Beer-Alston Devonshire.

No. 2. TUNGSTATE OF IRON. (*Phillips*).
WOLFRAM. (*Werner*).
SCHEELIN FERRUGINEUX.
(*Haüy*).
from Zinnwald in Bohemia.

No. 3. PRISMATO-PYRAMIDAL TITANIUM ORE.
RUTIL.
TITANE OXYDE.

No. 4. GRAY OXIDE OF MANGANESE.
MANGANIT. (*Haid*). GRAUBRAUNSTEIN. (*Hausm*).
ACERDESE. (*Beud*).
from Ihlefeld in the Harz.

No. 5. PRISMATIC FELSPAR. (*Jameson*).
FELDSPATH (W.) ORTHOKLAS. (*Breith.*)
ORTHOSE. (*Beud*).
from Lunguarruk (Greenland).

No. 6. CRIOLITE.
KRIOLITH, EISSTEIN.
ALUMINE FLUATEE ALCALINE,
from Ivikaet in West Greenland.

No. 7. Cube Spar, Prismatic Gypsum. *(Jam.)*
Anhydritspar, Muriazit. *(Werner).*
Chaux Sulfatée anhydre. *(Haüy).*
from Hall, Tyrol.

No. 8. Scapolite.
Skapolith. *(Wernerit).*
from Guljöe, Sweden.

No. 9. Hexahedral Rock-Salt. *(Jam.)*
Steinsalz.
Soude Muriatée. *(Haüy).*
from Wieliczka.

No. 10. Heavy Spar; Barytes.
Schwerspath; Baryte.
Baryte Sulfatée.
from Töplitz, Bohemia.

No. 11. Common Beryl.
Gemeiner Beryll.
Emeraude; Beril.
from Limoges in Francouid.

No. 12. Galena.
Bleiglanz. *(Werner).*
Galène; Plomb Sulfuré. *(Haüy).*
from Freiberg in Saxony.

No. 13. Sulphuret of zinc.
Zink blende.
Zinc Sulfuré.
from the Harz.

No. 14. Celestine.
Coelestin. *(Werner).*
Strontiane Sulfatée.
from Strontian.

No. 15. Carbonate of lime. *(Phill.)*
Kalkspath. Calcit. *(Haid.)*
Chaux Carbonatée. *(Haüy).*
from Borion Westphalia.

No. 16. Triphane.
Spodumen.
Lithion-Spodumen.
from Sterling, Massachussets.

No. 17. Mica.
Glimmer. *(Werner).* Zweiaxiger.
from Zinnwald in Bohemia.

No. 18. Axifrangible Gypsum. *(James.)*
Fraueneis. *(Gyps) (Werner).*
Chaux Sulfatée. *(Haüy).*
from Eisleben.

No. 19. Common Amphibole.
Hornblende in Trachyte.
Amphibole Common.
from Stenzelberg in the Siebengebirge.

No. 20. Ichthyophthalmite.
Apophyllit, Tesselit. *(Brewster).*
Apophylite. *(Haüy).*
from Andreasberg in the Harz.

MINERALS

TO ILLUSTRATE

MOHS' AND BREITHAUPT'S DEGREES OF HARDNESS.

THE hardness of minerals, or the power of resisting any attempt to separate their parts, is an important character, and being a purely relative distinction two scales have been formed by *MM. Breithaupt* and *Mohs*, composed of well known minerals of which each preceding one is scratched by those preceding it while the latter does not scratch the former. Mohs' scale reckons ten and Breithaupt's twelve degrees of hardness.

MOHS' AND BREITHAUPT'S DEGREES OF HARDNESS.

(Hardness—1 Breithaupt; 1 Mohs.)

No. 5. PRISMATIC TALC MICA. (*Jameson*).
TALK. (*Werner*).
TALC. (*Haüy*).
from Greiner in the Tyrol.

(Hardness—2 Breithaupt; 2 Mohs.)

No. 12. GYPSUM.
GYPS.
CHAUX SULFATEE.
from Eslében.

(Hardness—3 Breithaupt; 2·5 Mohs.)

No. 11. MICA.
GLIMMER, ZWEIAXIGER. (*Werner*).
from Zinnwald in Böhemia.

(Hardness—4 Breithaupt; 3 Mohs.)

No. 2. CALCITE. (*Dana*); CALCAREOUS SPAR.
KALKSPATH.
CHAUX CARBONATEE.
from Andreasberg in the Harz.

(Hardness—5 Breithaupt; 4 Mohs.)

No. 6. FLUOR-SPAR.
FLUSS SPATH.
CHAUX FLUATEE.
from Stallberg, Harz.

(Hardness—6 Breithaupt; 5 Mohs.)

No. 9. RHOMBOHEDRAL APATITE. (*Jameson*).
APATIT. (*Werner*).
CHAUX PHOSPHATEE. (*Haüy*).
from Arendal Norway.

(Hardness—7 Breithaupt; 5·5 Mohs.)

No. 4. Glassy Actinolite.
Glassiger Strahlstein.
Amphibole vitreux.
from Greiner in the Tyrol.

(Hardness—8 Breithaupt; 6 Mohs.)

No. 3. Prismatic Felspar. *(Jameson.)*
Adular. *(Werner).*
Feldspathe. *(Haüy).*
from St. Gothard.

(Hardness—9 Breithaupt; 7 Mohs.)

No. 1. Rock Crystal.
Berg kristall,
Quarz hyalin.
from Järischan in Silesia.

Hardness-10 Breithaupt; 8 Mohs.)

No. 8. Prismatic Topas.
Topas. *(Werner).*
Alumine fluatee Silicee.
from Villa Rica in Brasil.

(Hardness-11 Breithaupt; 9 Mohs.)

No. 7. Rhomboidal Corundum.
(Jameson).
Korund. Demantspath.
(Werner).
Corindon. *(Haüy).*
from China.

(Hardness--12 Breithaupt; 10 Mohs.)

No. 10. Octohedral Diamond.
Demant. *(Werner).*
Diamant. *(Haüy).*
from Minas Geraes in Brasil.

MINERALS

TO ILLUSTRATE

LUSTRE AND COLOUR.

The optical property of minerals are such as depend on light and are only observable in its presence. They include Lustre and Colour.

Lustre depends on the nature of the surface of a mineral, which causes light to be reflected in different ways and to a different extent. There are thus various kinds of lustre, Metallic, Vitreous, Resinous, Pearly, Silky, and Adamantine, and many degrees of Lustre as Splendent, Shining, Glistening, Glimmering and Dull.

Nos. 1—35. *Metallic Lustre and Colours.*
36—111. *Non-Metallic Colours.*
112—120. *Tarnish, Dichroism or Polychroism.*

METALLIC LUSTRE.

(Metallic lustre.)

No. 1. GRAY ANTIMONY ORE.
ANTIMONGLANZ.
ANTIMOINE SULFURE.
from the Caspari-Zeche near Arensberg.

(Metallic lustre,)

No. 2. IRON PYRITES.
SCHWEFELKIES. (*Werner*).
PYRITE.
from Traversella in Piedmont.

(Sub-metallic lustre.)

No. 3. TUNGSTATE OF IRON. (*Phillips*).
WOLFRAM. (*Werner*).
SCHEELIN FERRUGINEUX.
(*Haüy*).
from Zinnwald in Böhemia.

(Sub-metallic lustre.)

No. 4. COAL HOUILLE.
STEINKOHLE. BLATTERKOHLE.
from Essen on the Ruhr.

(Vitreous lustre.)

No. 5. Rock Crystal. (*Jameson*).
Bergkrystall.
Quarz-hyalin. (*Haüy*).
from St. Gothard.

(Vitreous lustre.)

No. 6. Calcite. (*Dana*); Calcareous Spar.
Kalkspath.
Chaux Carbonatée.
from Adreasberg in the Harz.

(Resinous lustre.)

No. 7. Vesuvian. (*Jameson*).
Vesuvian. (*Werner*).
(Fettglanz.) Idocrase.
(*Haüy*).
from Vesuvius.

(Resinous lustre.)

No. 8. Pitchstone.
Pechstein.
Pierre de Poix.
from Buschbad near Meissen.

(Resinous lustre.)

No. 9. Semi Opal.
Halbopal.
from Königswinter on the Rhine.

(Wavy lustre.)

No. 10. Semi Opal.
Halbopal.
from Königswinter on the Rhein.

(Pearly lustre.)

No. 11. Stilbite. (*Dana*).
Desmin. (*Breithaupt*);
Strahlzeolith.
Stilbit. (*Haüy*)
from Faröe.

(Pearly lustre.)

No. 12. Margarit. (*Fuchs*).
Perlglimmer. (*Mohs*).
from Pfitsch-Thal in Tyrol.

(Pearly lustre.)

No. 13. Gilbertit. (*Thomson*).
from St. Just in Cornwall.

(Metallic pearly.)

No. 14. Common Schiller-spar. (*Jam.*)
Schillerspath.
Diallage metalloide.
from the Baste in the Harz.

(Metallic pearly lustre.)

No. 15. Diallage (with Saussurite).
Bronzite.
from Imprunella, Tuscany.

(Silky lustre.)

No. 16. Fibrous Gypsum.
Faseriger Gyps.
Chaux Sulfatée fibreuse.
from Nordhausen Thuringia.

(Adamantine lustre.)

No. 17. Sulphuret of zinc.
Blende.
Zinc Sulfure.
from Neudorf, Harz.

(Splendent.)

No. 18. Iron glance.
Eisenglanz.
Fer oligiste.
from Rio, Elba.

(Splendent.)

No. 19. Rock Crystal.
Bergkristall.
Quarz hyalin.
from Järischän in Siberia.

(Shining.)

No. 20. Celestine.
Coelestin. (*Werner*).
Strontiane Sulfatee.
from Girgenti in Sicilia.

(Glistening.)

No. 21. Carbonate of Iron. Chalybite. (*Miller*).
Spatheisenstein. Siderit. (*Haid*).
Fer oxyde carbonate. (*Haüy*).
from Lobenstein.

(Glimmering.)

No. 22. Common calcedony.
Calzedon.
Calcedoine.
from Island.

(Glimmering.)

No. 23. Heliotrope.
Heliotrop. (*Werner*).
Quarz agathe ponctue.
from the Sriat.

(Dull.)

No. 24. Plasma. (*Werner*).
Quartz agate vert.
from Ofenburg in Baden.

(Dull.)

No. 25. Striped Jasper.
Bandjaspis. (*Werner*).
Jaspe rubanne.
from Gnandstein near Altenburg.

METALLIC COLOURS.

By colour is meant the colour of the entire mineral.

(Copper red.)

No. 26. Octohedral Copper.
Gediegen Kupfer.
Cuivre natif.
from the Lizard in Cornwall.

(Bronze yellow.)

No. 27. Magnetic Pyrites. (*Jameson.*)
Magnetkies.
Fer Sulfure.
from Bodenmais in. Bavaria.

(Brass yellow.)

No. 28. COPPER PYRITES. (*Phill.*)
KUPFERKIES. CHALKOPYRIT. (*Haid*).
CUIVRE PYRITEUX. (*Haüy.*)
from Tavistock, Devonshire.

(Silver white.)

No. 29. HEXAHEDRAL SILVER. (*Jameson*).
GEDIEGEN SILBER.
ARGENT NATIF. (*Haüy*).
from Schneeberg, Saxony.

(Silver white.)

No. 30. AXOTOMOUS ARSENIC PYRITES. (*Jameson*).
ARSENIKKIES. AXOTOMER. (*Mohs*).
FER ARSENICAL. (*Haüy*).
from Reichenstein in Ilesia.

(Gold yellow.)

No. 31. HEXAHEDRAL GOLD. (*Hy.*)
GEDIEGEN GOLD. (*Werner*).
OR NATIF. (*Haüy*).
from Veraspatak, Hungary.

(Tin white.)

No. 32. HEXAHEDRAL COBALT PYRITES.
GLANZKOBALT. (*Werner*).
COBALTE GRIS. (*Haüy*).
from Tunaberg in Sweden.

(Lead gray.)

No. 33. SULPHURET OF MOLYBDENA. (*Jameson*).
MOLYBDAENGLANZ. WASSERBLEI. (*Werner*).
MOLYBDENE SULFURE. (*Haüy*).
from Altenberg in Saxony.

(Lead gray inclining to redish.)

No. 34. GALENA. (*Phill*).
BLEIGLANZ. (*Werner*).
PLOMB SULFURE. (*Haüy.*)
from Neudorf, Harz.

(Steel gray.)

No. 35. NATIVE PLATINA. (*Jameson*).
GEDIEGEN PLATIN. (*Werner*).
PLATINE NATIF. (*Haüy*).
from Tagilsk in the Ural.

Nos. 36 *to* 111.

NON-METALLIC COLOURS.

(Snow white.)

No. 36. (ARRAGONITE.)
EISENBLUTHE. (*Werner*).
FLOS FERRI.
from Eisenerz in Steyermark.

(Yellowish white.)

No. 37. STALACTITE.
KALKSINTER.
TROPFSTEIN.
from Unkel near Bonn.

(Grayish white.)

No. 38. GRANULAR LIMESTONE.
KORNIGER KALK.
CALCAIRE SACCHAROIDE.
from Auerbach on the Bergstrasse.

(Greenish white.)

No. 39. FLUOR-SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Freiberg, Saxony.

(Milky white.)

No. 40. COMMON-OPAL.
GEMEINER OPAL. (*Werner*).
QUARZ RESINITE COMMUN.
from Baumgarten in Silesia.

(Bluish gray.)

No. 41. COMMON CALCEDONY.
CALZEDON.
CALCEDOINE.
from Oberstein.

(Pearly gray.)

No. 42. COMMON QUARTZ.
GEMEINER QUARZ.
from Tunaberg.

(Smoke gray.)

No. 43. FLINT.
FEUERSTEIN.
SILEX PYROMAQUE.
from Schonen.

(Greenish gray.)

No. 44. WHETSTONE-SLATE.
WETZ SCHIEFER.
SCHISTE COTICULE.
from Sciffersdorf near Freiberg.

(Yellowish gray.)

No. 45. FLINT.
FEUERSTEIN.
SILEX PYROMAQUE.
from Rügen.

(Ash gray.)

No. 46. MOUNTAIN SOAP.
BERGSEIFE.
SAVON DE MONTAGNE.
from Kusterschütz in the Mittelgebirge.

(Ash gray.)

No. 47. ZOISITE. (*Jameson.*)
ZOISIT. (*Werner.*)
EPIDOTE. (*Haüy.*)
from Gefrees in Bavaria.

(Grayish black.)

No. 48. BASALTE.
BASALT.
from Linz, Rhine.

(Velvet black.)

No. 49. OBSIDIAN. (*Werner*).
OBSIDIENNE.
from the Lipari Islands.

(Greenish black.)

No. 50. HORNBLENDE. (*Werner*).
AMPHIBOLE. (*Haüy*).
from Pargas Finnland.

(Greenish black.)

No. 51. HORNBLENDE. (*Werner*).
AMPHIBOLE. (*Haüy*).
from Arendal, Norway.

(Brownish black.)

No. 52. BROWN-COAL. (*Jameson*).
BRAUNKOHLE. (*Werner*).
HOUILLE BRUN. (*Haüy*).
from Töplitz.

(Brownish black.)

No. 53. MICA.
MUSCOVITE. (*Dana*).
ZWEIAXIGER GLIMMER.
from Miask in the Ural.

(Bluish black.)

No. 54. OXIDE OF COBALT.
ERDKOBALT.
COBALT OXYDE.
from Saalfeld in Thüringia.

(Azure blue.)

No. 55. BLUE COPPER ORE.
KUPFERLASUR. (*Werner*).
AZURITE. (*Beudant*).
from Moldawa, Banat,

(Violet blue.)

No. 56. AMETHYST.
AMETHYST.
QUARZ HYALIN VIOLET.
from Oberstein.

(Lavender blue.)

No. 57. FERRUGINOUS LITHOMARGE.
EISENSTEINMARK. (*Freiesleben*).
from Planitz near Zwickau.

(Prussian blue.)

No. 58. PRISMATIC KYANITE. (*Jameson*).
ZYANIT. (*Werner*). KYANIT. (*Breith*).
DISTHENE. (*Haüy*).
from Greiner in the Tyrol.

(Smalte blue.)

No. 59. COMMON CALCEDONY.
CALZEDON.
CALCEDOINE.
from Trestyan, Transylvania.

(Smalte blue.)

No. 60. ANHYDRITE. (*Jameson*).
ANHYDRIT DICHTER (*Werner*).
CHAUX SULFATEE ANHYDRE (*Haüy*).
from Sulz, on the Neckar.

(Indigo blue.)

No. 61. EARTHY BLUE IRON (*Jameson*).
BLAUEISENERDE (*Werner*).
FER PHOSPHATE TERREUX (*Haüy*).

(Indigo blue.)

No. 62. INDIGO COPPER.
KUPFERINDIG. (*Breithaupt*).
COVELLINE. (*Beudant*).
from Donzbach near Dillenburg in Nassau.

(Sky blue.)

No. 63. BLUE COPPER.
KUPFERLASUR. (*Werner*).
AZURITE. (*Beudant*).
from Rhein-breitbach.

(Verdigris green.)

No. 64. SILICO-CARBONATE OF COPPER (*Thomson*). On heavy spar.
CHRYSOCOLLA. KIESELKUPFER.
from Salfeld, Thuringia.

(Celandrine green.)

No. 65. GREEN EARTH.
GRUNERDE.
TERRE VERTE.
from Monte Baldo near Verona.

(Mountain green.)

No. 66. NOBLE BERYL.
EDLER BERYLL. (*Werner*).
EMERAUDE. (*Jameson*).
from Nertschink, Siberia.

(Leek green.)

No. 67. PRASE. (*Jameson*).
PRASEM. (*Werner*).
QUARZ HYALIN VERT OBSCUR. (*Haüy*).
from Brietenbrann, Saxony.

(Emerald green.)

No. 68. FIBROUS MALACHITE.
MALACHIT FASRIGER. (*Werner*).
CUIVRE CARBONATE VERT SOYEUX. (*Haüy*).
from Katherinenburg in the Ural.

(Apple green.)

No. 69. CHRYSOPRASE.
from Frankenstein, in Silesia.

(Grass green.)

No. 70. GLASSY ACTINOLITE.
GLASIGER STRAHLSTEIN.
AMPHIBOLE VITREUX.
from Greiner in the Tyrol.

(Grass green.)

No. 71. GREEN PHOSPHATE OF LEAD.
GRUNBLEIERZ (*Werner*)
PLOMB PHOSPHATE VERT. (*Haüy*).

(Pistachio green.)

No. 72. PRISMATOIDIAL AUGITE. (*Jameson*).
PISTACIT (*Werner*).
EPIDOTE (*Haüy*).
from Arendal, Norway.

(Asparagus green.)

No. 73. CONCHOIDAL APATITE. (*Jameson*).
SPARGELSTEIN (*Werner*).
CHAUX PHOSPHATEE (*Haüy*).
from Greiner in the Tyrol.

(Blackish green.)

No. 74. COCCOLITE. *(Jameson).*
KOKKOLITH. *(Werner).*
PYROXENE GRANULAIRE.
from Arendal in Norwegia.

(Oil green.)

No. 75. CHRYSOLITE *(Phillips).*
OLIVIN.
PERIDOT GRANULIFORME.
(Haüy).
from Dreis in the Eifel.

(Oil green.)

No. 76. PITCHSTONE.
PECHSTEIN.
PIERRE DE POIX.
from Buschbad near Meissen.

(Siskin green.)

No. 77. URANITE.
URAN GLIMMER.
KALKHALTIGER.
from Johann Georgenstadt, Saxony.

(Sulphur yellow.)

No. 78. PRISMATIC SULPHUR.
SCHWEFEL, NATURLICHER.
SOUFRE *(Haüy).*
from Girgenti in Sicilia.

(Straw yellow.)

No. 79. SCHORLITE. *(Jameson).*
PIKNIT. *(Werner).*
PICKNITE. *(Haüy).*
from Altenberg in Saxony.

(Wax yellow.)

No. 80. SULPHURET OF ZINC.
BLENDE.
ZINC SULFURE.
from Kapnik, Hungary.

(Honey yellow.)

No. 81. SEMI OPAL.
HALBOPAL.
from Libethen, Hungary.

(Honey yellow.)

No. 82. HONEYSTONE. *(Jameson).*
HONIGSTEIN. *(Werner).*
MELLITE. *(Haüy).*
from Artern in Thüringen.

(Lemon yellow.)

No. 83. PRISMATOIDAL SULPHUR.
(Jameson).
GELBES RAUSCHGELB. *(Werner).*
ARSENIC SULFURE JAUNE.
(Haüy).
from Persia.

(Lemon yellow.)

No. 84. URAN-OCHRE. *(Jameson).*
URANOCKER. *(Werner).*
from Joachimsthal in Böhemia.

(Ochre yellow.)

No. 85. IRON-OCHRE.
EISENOCKER.
FER OXIDE TERREUX.
from Elba.

(Wine yellow.)

No. 86. PRISMATIC TOPAS. (*Jameson*).
TOPAS. (*Werner*).
ALUMINE FLUATÉE SILICEUSE. (*Haüy*).
from the Schneckenstein in Saxony.

(Cream yellow.)

No. 87. MYELIN. (*Breith.*)
TALKSTEINMARK. (*Freissleben*).
from Rochlitz in Saxony.

(Orange yellow.)

No. 88. PYRAMIDAL LEAD-SPAR. (*Jameson*).
GELBBLEIERZ. (*Werner*).
PLOMB MOLYBDATE. (*Haüy*).
from Bleiberg in Carinthia.

(Aurora red.)

No. 89. CHROMATE OF LEAD (*Phill.*).
ROTHBLEIERZ KALLOCHROM (*Hausm.*)
PLOMB CHROMATE. (*Haüy*).
from Beresowsk in the Ural.

(Hyacinth red.)

No. 90. HYACINTH. (*Werner*).
HYACINTE.
from Ceylon.

(Brick red.)

No. 91. STILBITE. (*Haüy*).
FOLIATED ZEOLITE. (*Jameson*).
BLATTER-ZEOLITH. (*Werner*).
from Val di Fassa in the Tyrol.

(Scarlet red.)

No. 92. PRISMATIC RHOMBOIDAL RUBI-BLENDE.
ZINNOBER (*Werner*).
MERCURE SULFURÉ (*Haüy.*)
from Wolfstein, Rhinish Bavaria.

(Blood red.)

No. 93. PYROPE.
GRENAT ROUGE DU FEU.
from Meronitz in Böhemia.

(Flesh red.)

No. 94. PRISMATIC FELSPAR. (*Jameson*).
FELDSPATH. (*W.*) ORTHOKLAS. (*Breith.*)
ORTHOSE. (*Beud.*).
from Hirschberg in Silesia.

(Carmine red.)

No. 95. DODECAHEDRAL CORUNDUM. (*Jameson*).
SPINEL. (*Werner*).
SPINELLE. (*Haüy*).
from Ceylon.

(Rose red.)

No. 96. ROSE QUARTZ.
ROSENQUARZ.
QUARZE ROSE.
from Rabenstein in Bavaria.

(Rose red.)

No. 97. NEEDLE ZEOLITE.
MESOTYPSPATH. Natrolith in Klingstein.
ZÉOLITE EN AIGUILLES.
from Aussig in Böhemia.

(Peach blossom red.)

No. 98. LEPIDOLITE. LITHIA MICA. LEPIDOLITH. LITHIONGLIMMER.
from Rozena near Kradisks in Moravia.

(Peach blossom red.)

No. 99. RED COBALT OCHRE. (*Jameson*).
KOBALTBESOCHLAG (*Werner*).
COBALTE ARSENIATE PULVERULENT. (*Haüy*).
from Schneeberg.

(Columbine red.)

No. 100. PRECIOUS-GARNET; IRON-GARNET (*Dana*).
EDLER GARNAT.
ALMANDINE (*Beudant*).
from Greenland.

(Cherry red.)

No. 101. PRISMATIC ANTIMONY-BLENDE, (*James*).
ROTHSPIESGLASERZ (*Werner*).
ANTIMOINE OXYDE SULFURE. (*Haüy*).
from Bräunsdorf near Freiberg.

(Brownish red.)

No. 102. FERRUGINOUS QUARTZ. (*Dana*).
EISENKIESEL. (*Werner*).
QUARZ HYALIN HEMATOIDE; SINOPLE.
from Schellerhau in Saxony.

(Reddish brown.)

No. 103. FERRUGINOUS QUARTZ (*Dana*).
EISENKIESEL. (*Werner*).
QUARZ HYALIN HEMATOIDE; SINOPLE.
from Schellerhau in Saxony.

(Clove brown.)

No. 104. SMOKY QUARTZ.
RAUCH-QUARZ; BERGKRYSTALL.
QUARZ HYALIN ENFUME.
from St. Gotthard.

(Hair brown.)

No. 105. YELLOW HYDRATED OXIDE OF IRON.
GELBEISENSTEIN.
FER OXYDE HYDRATE JAUNE.
from Klein Schmalkalden.

(Chesnut brown.)

No. 106. JASPER (*Jameson*)
JASPIS (*Werner*)
QUARZ JASPE. (*Haüy*).
from Cairo.

(Yellowish brown.)

No. 107. HORNSTONE.
HORNSTEIN.
QUARTZ AGATE GROSSIER.
from Schneeberg Saxony.

(**Pinchbeck brown.**)

No. 108. HEMIPRISMATIC SCHILLER-SPAR. (*Jam.*)
BLATTRIGER ANTHOPHILIT. (*Werner*).
DIALLAGE METALLOIDE. BRONZIT. (*Haüy*).
from Kupferberg in Bavaria.

(**Wood brown.**)

No. 109. ROCK-WOOD.
BERGHOLZ. (*Werner*).
BOIS DE MONTAGNE.
from Sferzing in the Tyrol.

(**Liver brown.**)

No. 110. SEMI OPAL.
HALBOPAL.
from Bilin in Böhemia.

(**Blackish brown.**)

No. 111. BROWN-COAL. (*Jameson*).
BRAUNKOHLE. (*Werner*).
HOUILLE BRUN. (*Haüy*).
from Töplitz.

Nos. 112 *to* 120.

TARNISH. DICHROISM.

Under the term of Iridescence may be included a play or change of colours, opalescence, iridiscence and tarnish, with other peculiarities often very remarkable and well distinguishing certain minerals.

(**Play of colour.**)

No. 112. PRECIOUS OPAL.
EDLER OPAL.
QUARZ RESINITE OPALIN.
from Czerwenitza in Hungary.

(**Play of colour.**)

No. 113. LABRADOR FELSPAR. (*Jameson*).
LABRADOR. (*Werner*).
FELDSPATH OPALIN. (*Haüy*).
from Labrador.

(**Opalescence.**)

No. 114. COMMON-OPAL.
GEMEINER OPAL. (*Werner*).
QUARZ RESINITE COMMUN.
from Baumgarten in Silesia.

(**Iridescence.**)

No. 115. AVANTURINE FELSPATHIC.
SUNSTONE FELSHATHIC SONNENSTEIN.
from Twedestrand in Norway.

(**Painted.**)

No. 116. ARRAGONITE.
SPRUDELSTEIN.
CHAUX CONCRETIONEE.
from (Carlsband).

(With veins.)

No. 117. COMMON SERPENTINE.
SERPENTIN.
OPHIOLITHE.
from Zöblitz in Saxony.

Polychroism is a property belonging to some prismatic crystals, presenting a different colour in different directions. The term dichroism is sometimes used, the colours occurring only in two directions, as in Iolite, hence called Dichroite.

(Dichroism.)

No. 118. PRISMATOIDIAL AUGITE.
(*Jameson*).
PISTACIT. (*Werner*).
EPIDOTE (*Haüy*).
from Dauphine.

(Dichroism.)

No. 119. IOLITE.
CORDIERITE.
DICHROITE.
from Haddam, Connecticut.

(Dichroism.)

No. 120. TOURMALINE.
EDLER TURMALIN.
TOURMALINE.
from St. Pietro, in Elba.

MINERALS

TO ILLUSTRATE

DIAPHANEITY, REFRACTION AND PHOSPHORESCENCE.

TRANSPARENCY is the property which many substances possess of transmitting light, and such are termed transparent; semi-transparent; translucent; sub-translucent and opaque, according to the quantity of light transmitted.

Nos. 1 *to* 8.

DIAPHANEITY.

(Transparent.)

No. 1. AXIFRANGIBLE GYPSUM. (*James.*)
FRAUENEIS. (*Gyps*). (*Werner*).
CHAUX SULFATEE. (*Hy*).
from Eisleben.

(Transparent.)

No. 2. ROCK-CRYSTAL. (*Jameson.*).
BERGKRYSTALL.
QUARZ-HYALIN. (*Haüy*).
from St. Gotthardt.

(Translucent.)

No. 3. COMMON QUARTZ.
GEMEINER QUARZ.
from Freiberg, Saxony.

(Translucent.)

No. 4. CALCITE. (*Dana*); CALCAREOUS SPAR.
KALKSPATH.
CHAUX CARBONATEE.
from Andreasberg in the Hartz.

(Translucent.)

No. 5. ROSE QUARTZ.
ROSENQUARZ.
QUARZ ROSE.
from Rabenstein in Bavaria.

(Semi-translucent.)

No. 6. ALABASTER
GESSO. KORNIGER GYPS.
ALABATRE.
from Castellina in Tuscany.

(Semi-translucent.)

No. 7. SEMI OPAL.
HALBOPAL.
from Libelthen, Hungary.

(Semi-translucent.)

No. 8. FLINT.
FUERSTEIN.
SILEX PYROMAQUE.
from Reigen.

Nos. 9 to 24.

REFRACTION.

A ray of light proceeding from any object and passing from any one medium or transparent substance to another is more or less bent out of its original direction and this bending is called refraction. *But when a ray of light passes through certain minerals it is separated into two parts, each part undergoing a different refraction and ultimately emerging by itself. An object seen through such a mineral is seen double, and the phenomena is called double refraction.*

(Refractive and polarising.)

No. 9. DOUBLE REFRACTING SPAR.
DOPPELSPATH.
CHAUX CARBONATEE.
from the Eastern Coast Islands.

(Refractive.)

No. 10. ARRAGONITE.
ARRAGONIT. (*Hy.*)
from Bilin in Böhemia.

(Refractive.)

No. 11. ROCK CRYSTAL. (*Jameson*).
BERGKRYSTALL.
QUARZ-HYALIN. (*Haüy*).
from St. Gotthardt.

(Refractive.)

No. 12. NOBLE BERYL.
EDLER BERYLL. (*Werner*).
EMERAUDE. (*Jameson*).
from Nertschink, Siberia.

(Refractive.)

No. 13. PRISMATIC TOPAS.
TOPAS. (*Werner*).
ALUMINE FLUATEE SILICENSE.
from Villa Rica in Brasil.

(Refractive.)

No. 14. FLUOR-SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Bear Ashton, Devonshire.

(Refractive.)

No. 15. PRISMATIC FELSPAR.(*Jameson*).
ADULAR. (*Werner*).
FELDSPATHE. (*Haüy*).
from St. Gotthardt.

(Refractive.)

No. 16. DIOPSIDE.
DIOPSID.
from Rothenkopf, Tyrol.

(Tarnished by passing in brown iron ore.)

No. 17. IRON GLANCE.
EISENGLANZ.
FER OLIGISTE.
from Rio, Elba.

(Tarnished.)

No. 18. IRON GLANCE.
EISENGLANZ.
FER OLIGISTE.
from Rio, Elba.

(Tarnished.)

No. 19. HEXAHEDRAL IRON-PYRITES. (*Jameson*).
SCHWEFELKIES. (*Werner*).
FER SULFURE. (*Haüy*).
from Santa fe de Bogota.

(Tarnished.)

No. 20. OCTAHEDRAL BISMUTH. (*James.*)
GEDIEGEN WISMUTH. (*Werner*).
BRISMUTH NATIF. (*Haüy*).
from Schneeberg, Saxony.

(Tarnished.)

No. 21. NATIVE ARSENIC.
GEDIEGEN ARSENIK. (*Werner*).
ARSENIC NATIF. (*Haüy*).
from Andreasberg in the Harz.

(Tarnished.)

No. 22. VARIEGATED COPPER.
BUNTKUPFERERZ. (*Werner*).
CUIVRE PYRITEUX HEPATHIQUE. (*Haüy*).
from Lauterberg in the Harz,

(Tarnished.)

No. 23. ALLOPHANE.
ALLOPHAN (STROMEIER).
from Saalfeld, Thuringia.

(Tarnished,)

No. 24. FOLIATED COAL.
BLATTERKOHLE.
HOUILLE FEULLETE.
from Waldenburg Selesia.

Nos. 25 *to* 30.

PHOSPHORESCENCE.

The property of remitting light, either by friction or when gently heated, is called phosphorescence *and is possessed by several minerals.*

(Evolving light by friction.)

No. 25. COMMON QUARTZ.
GEMEINER QUARZ.
from Freiberg, Saxony.

(Phosphorescent by friction.)

No. 26. SULPHURET OF ZINC.
BLENDE.
ZINC SULFURE.
from Kaprik, Hungary.

(Phosphorescent by friction.)

No. 27. AMPHIBOLE FIBREUX.
TREMOLITH. (*Werner*).
from St. Gothard.

(Phosphorescent by means of heat.)

No. 28. FLUOR SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Tavistock, Devonshire.

(Phosphorescent by means of heat.)

No. 29. PHOSPHATE OF LIME.
PHOSPHORIT. (*Werner*).
CHAUX PHOSPHATE.
from Logrosan in Estremadura.

(Phosphorescent by means of heat.

No. 30. PREDAZZIT. (*Petzhold*).
from Predazzo in the Tyrol.

INSTRUMENTS.

A delicate Electroscope.
A delicate Magnetoscope.
Senarmonts apparatus and crystals to illustrate the thermotic characters of minerals.

MINERALS

TO ILLUSTRATE

TASTE AND ODOUR.

Nos. 1 *to* 7.

TASTE.

(Alkaline taste.)

No. 1. CARBONATE OF SODA.
from Chile.

No. 2. OCTAHEDRAL SALT-AMMONIAC. *(Jam.)*
SALMIAK. *(Werner).*
AMMONIAQUE MURIATEE. *(Haüy).*
from Vesuvius (Eruptn of 1834.)

(Saline taste.)

No. 3. ROCK-SALT.
STEINSALZ. *(Werner).*
SOUDE MURIATE.
from Hall in Würtenberge.

(Cooling.)

No. 4. NATRON. SALTPETRE.
SOUDE NITRATEE. *(Haüy).*
from Chile.

(Sweetish astringent.)

No. 5. ALUNOGENE. *(Beudant).*
KERAMOHALIT. *(Glocker).*
from Schemnitz.

(Metallic astringent.)

No. 6. RHOMBOIDAL VITRIOL. *(Jam).*
FER SULFATE. *(Haüy).*
EISENVITRIOL. *(Werner).*
from Rammelsberg near Goslar in the Hartz.

(Bitter saline taste.)

No. 7. EPSOM SALT.
from Idria.

Nos. 8 *to* 20.

ODOUR.

(Bituminous odour.)

No. 8. ASPHALT.
BITUME SOLIDE.
from Limmer near Hanover.

(Sulphureous odour.)

No. 9. PRISMATIC SULPHUR.
SCHWEFELD, NATURLICHER.
SOUFRE.
from Wenzen, Hanover.

(Argillaceous odour.)

No. 10. CLAY.
from Lenz near Bonn on the Rhine

(Argillaceous odour.)

No. 11. TRACHYTE.
from Berkum near Bonn.

(Argillaceous odour.)

No. 12. MICA.
GLIMMER. (*Werner*). ZWEIAXIGER.
from Zinnwald in Böhemia.

(Bitter Argillaceous odour.)

No. 13. PIKROSMINE.
PIKROSMIN. (*Heidinger*).
from Zöblitz in Saxony.

Fetid bituminous (by friction.)

No. 14. ANTHRACONITE.
from Andarum, Schönen.

Fetid bituminous (by friction.)

No. 15. ANTHRACONITE. (*Lucullan*).
from Sundaland.

Fetid bituminous (by friction.)

No. 16. HEPATIT. (Sulphate of Barytes.)
from Andrarum, (Schonen.)

Sulphureous odour (by friction.)

No. 17. PYRITES.
SCHWEFELKIES.
FER SULFURE. (*Haüy*).
from Marienberg near Bonn.

Alliaceous odour (by friction.)

No. 18. PRISMATIC ARSENICAL PYRITES. (*Jameson*).
ARSENIKKIES. (*Werner*).
FER ARSENICAL. (*Haüy*).
from Freiberg.

(Aromatic odour.)

No. 19. OZOKERITE.
ERDWACHS.
OZOKERIT. (*Glocker*).

(Horseradish odour.)

No. 20. SELENIURET OF LEAD.
SELENBLEI. CLAUSTHALIT. (*Haid*).
SELENIURE DE PLOMB.
from Tilkerode in the Harz.

MINERALS

TO ILLUSTRATE

ELECTRICITY AND MAGNETISM.

No. 1 *to* 28 *becoming* + *electr. by friction.* *No.* 33 *to* 38 *electr. by heat.*
No. 29 *to* 32 *becoming* — *electr. by friction.* *No.* 39 *to* 50 *Magnetism.*

Becoming + *electr. by friction, viz.*
No. 1 *to* 28—*Becoming positive electric, by friction.*

No. 1. HEXAHEDRAL ROCK-SALT. (*Jam*).
STEINSALZ.
SOUDE MURIATEE. (*Haüy*).
from Wieliczka.

No. 2. GYPSUM.
GYPS.
CHAUX SULFATEE.
from Montmartre, near Paris.

No. 3. ANHYDRITE. (*Jameson*).
ANHYDRIT DICHTER. (*Werner*).
CHAUX SULFATEE ANHYDRE. (*Haüy*).
from Sulz a Neckar.

No. 4. FLUOR-SPAR.
FLUSSSPATH.
CHAUX FLUATEE.
from Derbyshire.

No. 5. ARRAGONITE.
ARRAGONIT. (*Haüy*).
from Bilin in Bohemia.

No. 6. CARBONATE OF LIME. (*Phill.*).
KALSPATH-CALCIT. (*Haid.*).
CHAUX CARBONATEE. (*Haüy*).
from Auerbach-Saxony.

No. 7. MIEMITE.
from Tuscany.

No. 8. CARBONATE OF STRONTIAN.
STRONTIANIT.
STRONTIANE CARBONATEE.
from Hamm in Westphalia.

No. 9. CARBONATE OF BARYTES.
WITHERIT (*Werner*).
BARYTE CARBONATEE. (*Haüy*).
from Alston in Cumberland.

No. 10. Heavy spar ; Barytes.
Schwerspath ; Baryte.
Baryte Sulfatee,
from Freiberg in Saxony.

No. 11. Celestine.
Coelestin. *(Werner).*
Strontiane Sulfatee.
from Strontian.

No. 12. Carbonate of lead.
Weissbleierz.
Plomb carbonate.
from the Grabe Kurfürst Ernst of Boenkhausen near Arensberg.

No. 13. Calamine.
Galmei. Zinkspath.
Zinc Carbonate *(Haüy).*
from Dagdnadzka, Banat.

No. 14. Mica.
Zweiaxiger Glimmer.
Muscovite. *(Dana).*
from Miask in the Ural.

No. 15. Prismatic Kyanite. *(Jameson).*
Zyanit. *(Werner).* Kyanit *(Breith.).*
Disthene. *(Haüy).*
from Greiner in the Tyrol.

No. 16. Stilbite. *(Dana).*
Desmin. *(Breithaupt)*; Strahlzeolith.
Stilbit. *(Haüy)* partim.
from Faröe.

No. 17. Axifrangible zeolite.
(Jameson).
Ichthiopthalm *(Werner).*
Apophillite. *(Haüy).*
from the Seisser-Alp in the Tyrol.

No. 18. Hexahedral Zeolite. *(Jameson).*
Analzim. *(Werner).*
Analcime. *(Haüy).*
from the Seisser-Alp in the Tyrol.

No. 19. Elæolith.
Pierre grasse.
from Brenig in Norway.

No. 20. Prismatic Felspar, *(Jameson).*
Adular. *(Werner).*
Feldspathe. *(Haüy).*
from St. Gotthardt.

No. 21. Basaltic Hornblende.
Basaltische Hornblende *(Werner).*
Amphibole basaltique.
from Schima in Böhemia.

No. 22. Augite. *(Jameson).*
Gemeiner Augit. *(Werner).*
Pyroxene *(Haüy).*
from Schima in Böhemia.

No. 23. Epidote *(Haüy.).*
Pistacit. Thallit. *(Hausm.).*
from Arendal in Norway.

No. 24. Blue Spinell.
Blauer Spinell.
Spinelle blue.
from Aoker in Sweden.

No. 25. Iolite.
Cardierite.
Dichroit. Steinheilit, Peliom.
from Orijarfvi Finnland.

No. 26. Rock crystal.
Bergkristall.
Quarz hyalin.
from Jarischau in Silesia.

No. 27. Egerane. (var: from Vesuvius.)
Egeran (*Werner*).
from Haslan near Eger in Böhemia.

No. 28. Precious garnet; Iron-garnet (*Dana*).
Edler Granat.
Alamandine (*Beudant*).
from Greenland.

MINERALS NEGATIVE ELECTRIC BY FRICTION.

(Negative electric by friction.)

No. 29. Prismatic Sulphur.
Schwefeld, naturlicher.
Soufre. (*Haüy*).
from Girgenti in Sicily.

(Negative electric by friction.)

No. 30. Schlaggy Mineral Pitch. (*Jameson*).
Schlackiges Erdpech. (*Werner*).
Bitume Solide. (*Haüy*).
from Asphalte lake.

(Negative electric by friction.)

No. 31. Yellow Mineral-Resin (*Jameson*).
Bernstein. (*Werner*).
Succin. (*Haüy*).
from the shores of the Indian Ocean.

(Negative electric by friction.)

No. 32. Honeystone. (*Jameson*).
Honigstein. (*Werner*).
Mellite. (*Haüy*).
from Artern in Thüringia.

(Positive electric by compression.)

No. 33. Double refracting spar.
Doppelspath.
Chaux carbonate.
from the Island of the Eastern Coast

(Polar electric by heat.)

No. 34. Rhomboidal Tourmaline.
(*Werner*).
Schorl, Turmalin. (*Werner*).
Tourmaline. (*Haüy*).
from Elba.

(Polar electric by heat.)

No. 35. TOURMALINE.
EDLER TURMALIN.
TURMALINE.
from St. Pietro and Elba.

(Polar electric by heat.)

No. 36. BORATE OF MAGNESIA.
BORACIT.
MAGNESIE BORATRE. (*Haüy*).
from Kalkberg near Lüneburg.

(Polar electric by heat.)

No. 37. PRISMATIC TOPAS.
TOPAS. (*Werner*).
ALUMINE FLUATRE SILICEUSE.
from Villa Rica in Brasil.

(Polar electric by heat.)

No. 38. ELECTRIC CALAMINE. (*Dana*).
KIESELGALMEI. (*V. Kob*);
ZINKGLAS. (*Hausm*).
ZINC SILICATE. *Dufrénoy*).
from Altenberg near Aachen.

(Magnetic minerals.)

No. 39. NATIVE LOADSTONE.
ATTRACTORISCHES MAGNETEISEN.
FER OXYDULE. (*Haüy*).
from Monte Calamita, Elba.

(Attracts.)

No. 40. MAGNETIC IRON ORE.
MAGNETEISEN ; MAGNETIT.
(*Haid.*)
FER OXYDULE. (*Haüy*) ; AIMANT. (*Beud*).
from Arendal in Norway.

(Attracts.)

No. 41. MAGNETIC IRON ORE.
MAGNETEISEN (*Werner*) ;
MAGNETIT. (*Haid.*)
FER OXYDULE. (*Haüy*) ; AIMANT. (*Beud.*).
from Phillippstadt in Sweden.

(Attracts.)

No. 42. RHOMBOIDAL IRON-ORE.
(*Jameson*).
MAGNETEISENSTEIN. (*Werner*).
FER OLIGISTE. (*Haüy*).
from Breitenbrun in Saxony.

(Attracts.)

No. 43. MAGNETIC IRON.
MAGNETEISEN. (*Werner*).
FER OXYDULE.
from Greinec in the Tyrol.

No. 44. CHROMIC IRON. (*Dana*).
CHROMEISENSTEIN ; CHROMIT.
(*Haid*).
SIDEROCHROME. (*Beudant*).
from Grachan, Silesia.

No. 45. TITANIFEROUS IRON, in Basalt.
TITANEISEN in Basalt.
TITANATE DE FER in Basalt.
from Unkel on the Rhine.

No. 46. TITANIFEROUS IRON.
TITANEISENERZ.
FER TITANE.
from Egersund, Norway.

No. 47. ISERINE.
from Riesengeberge.

No. 48. FRANKLINITE.
from Sparta in New-Jersey.

No. 49. MAGNETIC PYRITES, (*Jameson.*)
MAGNETKIES.
FER SULFURE.
from Bodenmais in Bavaria.

No. 50. IRON GLANCE.
EISENGLANZ.
FER OLIGISTE.
from Rio, Elba.

B. CHEMICAL CHARACTERS OF MINERALS.

MINERALS

TO ILLUSTRATE

KOBELL'S SCALE OF FUSIBILITY.

No. 1. PRISMATIC FELSPAR. (*Jameson*).
ADULAR. (*Werner*).
FELDSPATHE. (*Haüy*).
from St. Gothardt, Switzerland.

No. 2. GRAY ANTIMONY ORE.
ANTIMONGLANZ.
ANTIMOINE SULFURE
from the Caspari Zeche near Arensberg.

No. 3. HEMIPRISMATIC SCHILLER-SPAR. (*Jam.*)
BLATTRIGER ANTHOPHILIT. (*Werner*).
DIALLAGE METALLOIDE. BRONZIT. (*Haüy*).
from Kupferberg in Bavaria.

No. 4. PRECIOUS GARNET; IRON-GARNET. (*Dana*).
EDLER GRANAT.
ALAMANDINE. (*Beudant*).
from Greenland.

No. 5. GLASSY ACTINOLITE.
GLASIGER STRAHLSTEIN.
AMPHIBOLE VITREUX.
from Greiner in the Tyrol.

No. 6. NEEDLE ZEOLITE.
MESOTYPSPATH. NATROLITH in Klingstein.
ZEOLITE EN AIGUILLES.
from Aussig in Bohemia.

CATALOGUE

OF THE

GOVERNMENT CENTRAL MUSEUM,

MADRAS.

ARRANGED AND COMPILED

BY

EDWARD BALFOUR, Esq., Surgeon, Madras Army,

OFFICER IN CHARGE.

B. PALÆONTOLOGY—Part II.

BY ORDER OF THE GOVERNMENT

OF

MADRAS.

MADRAS:
Printed at the Military Male Orphan Asylum Press, Mount Road.

1855.

I am indebted to Professor MORRIS, Professor of Geology University of London, for the greatest part of these specimens.

PALÆONTOLOGY gives us an account of the remains of organic bodies, contained in, and associated with the inorganic materials of which the surface of the earth is composed, and it is of such organic remains as are in the Museum and of the rocks in which they are found that I have endeavoured, in the following pages, to construct a catalogue. In making this catalogue of the Aqueous Rocks and of the animal and vegetable remains which are found in them, the whole have been arranged Chronologically with reference to the successive geological periods when they originated. These remains are termed fossils by which is meant a body, or the traces of the existence of any body, whether animal or vegetable, which has been buried in the earth by natural causes. It is in the Aqueous Rocks that fossils chiefly occur for which reason this class of rocks are often called fossiliferous though the term sedimentary is likewise given from the circumstance of their having been deposited from water. These rocks are stratified or divided into distinct layers or strata, for *stratum* simply means a bed or any thing spread out or *strewed* over a given surface. Looking to the whole history of former life it is now almost every where acknowledged that during the formation of the sediments which compose the crust of the earth, the mineral kingdom has been at least three times entirely renovated. This has led to the whole of these strata being grouped into three great classes called the primary, secondary and tertiary, representing three periods of time, the secondary and tertiary periods being each as clearly characterised by a distinct fauna as the primeval series. Under this view the number of classes into which the fossiliferous strata may be separated are three,—but the groups may be more or less numerous according to the views of classification which different geologists entertain. The German, French and English geologists, however, who have determined the succession of strata throughout the greater part of Europe have pretty generally adopted the following arrangement of the groups of the fossiliferous strata which have been observed in Western Europe and almost all of which have their representatives in the British Isles.

TABLE I.

Showing the Nineteen Subordinate Groups of Fossiliferous Strata observed in Western Europe, arranged under three principal Sections in what is termed a descending Series or beginning with the newest.

Tertiary, Supracretaceous*, or Cainozoic.†	Secondary or Mesozoic.†	Primary fossiliferous, or paleozoic.†
1 Post Pliocene, including those of the Recent, or human period.	6 Chalk.	14 Permian.
2 Newer Pliocene, or Pleistocene.	7 Greensand.	15 Coal.
3 Older Pliocene.	8 Wealden.	16 Old Red Sandstone or Devonian.
4 Miocene.	9 Upper Oolite.	17 Upper Silurian.
5 Eocene.	10 Middle Oolite.	18 Lower Silurian.
	11 Lower Oolite.	19 Cambrian and older fossiliferous strata.
	12 Lias.	
	13 Trias.	

It is not pretended that the three principal sections in the above table, No. I, called primary, secondary, and tertiary, are of equivalent importance or that the nineteen subordinate groups comprise monuments relating to equal portions of past time or of the earth's history. But it can be asserted that they each relate to successive periods during which certain animals and plants, for the most part peculiar to their respective eras, have flourished, and during which different kinds of sediment have been deposited in the space now occupied by Europe. If disposed on palæontological grounds‡ to divide the entire fossiliferous series into a few groups less numerous than those in the above table, and more nearly coordinate in value than the sections called primary, secondary and tertiary, Sir Charles Lyell considers that the six groups or periods given in the next table might be adopted.

TABLE II.

Showing the Fossiliferous Strata of Western Europe divided into six Sections.

1 Post Pliocene and Tertiary..from the Post Pliocene to the Eocene inclusive.
2 Cretaceous.....from the Maestricht chalk to the Lower Greensand inclusive.
3 Oolitic.....from the Wealden to the Lias inclusive.
4 Triassic.....including the Keuper, Muschelkalk, and Buntster Sandstein of the Germans.
5 Permian, Carboniferous, and Devonian.....including Magnesian Limestone (Zechstein,) Coal, Mountain Limestone and Old Red sandstone.
6 Silurian and Cambrian... ...from the Upper Silurian to the oldest fossiliferous rocks inclusive.

* For tertiary Sir H. De la Beche has used the term Supracretaceous, a name implying that the strata so called are superior in position to the chalk.

† Professor Phillips has adopted these terms, Cainozoic, from *Cainos*, recent, and *Zoon*, animal. Mesozoic, from *mesos*, middle &c; paleozoic, from *palaios*, ancient, &c.

‡ Palæontology is the science which treats of fossil remains both animal and vegetable. Its derivation being from *palaios*, ancient, *onta*, beings, and *logos*, a discourse.

GLOSSARY OF TERMS, ADOPTED INTO GEOLOGY FROM THE LATIN AND GREEK.

1 CAINOZIC,.....from *cainos*, recent, and *zoon*, animal.

2 CAMBRIAN,.....is a geological name suggested by Professor Sedgwick to designate part of the Silurian series of North Wales.

3 DEVONIAN,.....because that class of rocks are greatly developed in Devonshire.

4 EOCENE,..... from *eos*, dawn and *cainos*, recent, implying that these fossils and rocks mark the dawn or commencement of the life in the Tertiary period.

5 LIAS,.....A provincial appellation, now generally adopted to designate the clayey limestone occurring between the upper new red sandstone and the oolite.

6 MIOCENE.....from *meion*, less, and *cainos*, recent, implying that they are less recent than the Eocene.

7 OOLITE,.....from oolos, egg, a limestone composed of rounded particles like the roe of a fish.

8 PALEOZOIC,.....from *palaios*, ancient, and *zoon*, life, implying those animals and vegetables that were most remotely formed.

9 PERMIAN,.....because this class of rocks are greatly developed in the Russian territory of Perm.

10 POST,.....after or subsequent to,—

11 PLIOCENE,.....from *pleion*, more, and *cainos*, recent.

12 PRIMARY,.....from *primus*, first, implying that this class comprise the primeval formed rocks.

13 SECONDARY,.....from *secundus*, second, implying second formed.

14 SILURIAN,.....because these rocks were first examined in a part of Britain wherein an ancient people, termed the Silures, had opposed a valorous resistance to the Romans.

15 SUPRACRETACEOUS.from *supra*, above, and *creta*, chalk.

16 TERTIARY,.....from *tertius*, third, because third formed.

17 TRIAS,.....the name given on the continent to the beds of new red sandstone.

18 WEALDEN,.....from the circumstance that these rocks occur in the Weald of Sussex.

INDEX.

PART II.

DESCRIPTIVE GEOLOGY.

AQUEOUS ROCKS.

POST TERTIARY.

A. POST PLIOCENE GROUP.

Periods and Groups.	*Examples.*	*Observations.*
1. Recent.....	Peat mosses and shell-marl, with bones of land animals, human remains and works of art..... Newer parts of modern deltas and coral reefs.....	All the imbedded shells, freshwater, and marine, of living species, with occasional human remains and works of art.
2. Post Pliocene....	Clay, marl, and volcanic tuff of Ischia, p. 113..... Loess of the Rhine, p. 117..... Newer part of boulder formation, with erratics, p. 148.....	All the shells of living species. No human remains or works of art. Bones of quadrupeds, partly of extinct species.

NONE.

I. TERTIARY.

B. PLIOCENE GROUP.

Periods and Groups.	*Examples.*	*Observations.*
3. Newer Pliocene or Pleistocene.	Boulder formation or drift of northern Europe and North America, chaps. 11 and 12..... Cavern deposits and osseous breccias. p. 153..... Fluvio-marine crag of Norwich, p. 148.. Limestone of Girgenti, in Sicily, p. 152.	Three-fourths of the fossil shells of existing species. A majority of the mammalia extinct but the genera corresponding with those now surviving in the same great geographical and zoological province, p. 157. During part of this period icebergs frequent in the seas of the northern hemisphere, and glaciers on hills of moderate height.

No.

1. APORRHAIS PES-PELICANI. PLIOCENE, *Norfolk.*
2. ASTARTE BOREALIS. PLIOCENE, *Sweden.*
3. NUCULA. PLIOCENE, *Portland, Maine.*
4. NUCULA PORTLANDICA. PLIOCENE, *Portland, Maine.*
5. SANGUINOLARIA FUSCA. PLIOCENE, *Portland, Maine.*
6. UNIO PICTORUM, MAMMALIAN DEPOSITS, *Valley of Thames.*
7. VENUS CHIONE. PLIOCENE, *Astigiani.*

4. Older Pliocene..	Red and Coralline crag of Suffolk, p. 162..... Subapennine beds, 166.....	A third or more of the species of Mollusca extinct. Nearly, if not all, the mammalia extinct.

8. FUSUS CONTRARIUS, CRAG, *Suffolk.*
9. FUSUS SCALARIFORMIS, PLIOCENE, *Sweden.*

C. MIOCENE GROUP.

Periods and Groups.	*Examples.*	*Observations.*
5. Miocene.....	Faluns of Touraine, p. 168..... Part of Bourdeaux beds, p. 171..... Part of Molasse of Switzerland, p. 171..	About two-thirds of the species of shells extinct. The recent species of shells often not found in the adjoining seas, but in warmer latitudes. All the mammalia extinct.

No.

1. CANCELLARIA ACUTANGULA? MIOCENE, *Bourdeaux.*
2. CYRENA SUBURATA. MIOCENE.
3. CYTHEREA. MIOCENE, *Bourdeaux.*
4. FUSUS BURDIGALENSIS. MIOCENE. *Bourdeaux.*
5. NATICA VARIABILIS. MIOCENE.
6. PECTUNCULUS. MIOCENE, *Bourdeaux.*
7. SPONDYLUS. MIOCENE, *Astigiani.*
8. STROMBUS ITALICUS. BONELLI. MIOCENE? *Montapa.*
9. TURRITELLA TEREBRATIS. MIOCENE, *Bourdeaux.*

D. EOCENE GROUP.

Periods and Groups.	*Examples.*	*Observations.*
6. Upper Eocene...	Upper marine of Paris basin, Fontainebleau sandstone, p. 175..... Upper freshwater and millstone of same. Kleyn Spawen beds, p. 176..... Hermsdorf tile-clay, near Berlin.. .... Mayence tertiary strata, p. 177 ..... Freshwater beds of Limagne d' Auvergne, p. 181.....	Fossil shells of the Eocene period, with very few exceptions, extinct. Those which are identified with living species rarely belong to neighbouring regions. All the mammalia of extinct species, and the greater part of them of extinct genera. Plants of Upper Eocene, indicating a south European or Mediterranean climate; those of Lower Eocene, a tropical climate.

1. TERTIARY LIMESTONE. *Brunn* near *Vienna.*
2. CALYPTRŒA TROCHIFORME. EOCENE, *Southampton.*
3. CARDITA ACUTICOSTA. EOCENE, *Paris.*
4. CASSIDULUS. ? EOCENE, *Normandy.*
5. FUSUS BULBIFORMIS. EOCENE, *Paris basin.*
6. HELIX VECTENSIS. UPPER EOCENE, *Isle of Wight.*
7. HIPPOTHERIUM GRACILE. TEETH OF: *Eppelsheim* near *Mayence.*

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7. Middle Eocene..	Paris gypsum with Palœotherium, &c. p. 191..... Freshwater and fluvio-marine beds, of Headen Hill, Isle of Wight, p. 197... Barton beds, Hants, p. 198.... .... Calcaire Grossier, Paris, p. 193..... Bagshot and Bracklesham beds, Surrey and Sussex, p. 198.....	Fossil shells of the Eocene period, with very few exceptions, extinct. Those which are identified with living species rarely belong to neighbouring regions. All the mammalia of extinct species, and the greater part of them of extinct genera. Plants of Upper Eocene, indicating a south European or Mediterranean climate; those of Lower Eocene, a tropical climate.

8. ACTÆON SIMULUTUS. EOCENE, *Barton.*

No.

9. ANOMIA STRIATA. EOCENE, *Bracklesham.*
10. BALANUS ERISMA. EOCENE, *Isle of Wight.*
11. BUCCINUM CANALICULATUM (FUSUS,) EOCENE, *Barton.*
12. BULIMUS ELLIPTICUS. EOCENE, *Isle of Wight.*
13. CALYPTREA TROCHIFORME. EOCENE, *Barton.*
14. CHAMA SQUAMOSA. EOCENE, *Barton.*
15. CANCER TUBERCULATUS. EOCENE, *Isle of Wight.*
16. CANCELLARIA. EOCENE, *Isle of Wight.*
17. CARDIUM SEMI-GRANULOSUM. EOCENE, *Bracklesham-bay.*
18. CERITHIUM CINCTUM. EOCENE, Upper marine, *Headon-hill, Isle of Wight.*
19. CERITHIUM CONCAVUM. EOCENE, Upper freshwater, East end of *Colwell-bay, Isle of Wight.*
20. CERITHIUM MARGARITACEUM. EOCENE, Upper marine, *Colwell-bay, Isle of Wight.*
21. CORBULA LONGIROSTRUM. EOCENE, *Barton.*
22. CASSIDARIA STRIATA. EOCENE, *Barton.*
23. CRAB.
24. CRAB, FOSSIL. *Sheppey.*
25. CRAB. *Sheppey.*
26. CRAB, *Sheppey.*
27. CRAB, *Sheppey.*
28. CYCLOTUS CINCTUS. EOCENE, *Isle of Wight.*
29. CYRENA OBOVATA. EOCENE, *Isle of Wight.*
30. CYTHEREA INCRASSATA. MIDDLE EOCENE, *Isle of Wight.*
31. EUOMPHALUS DISCUS. UPPER EOCENE, *Isle of Wight.*
32. FRESHWATER LIMESTONE, *Isle of Wight.*
33. FUSUS ACICULATUS. EOCENE, *Barton.*
34. FUSUS LABIATUS. EOCENE, Upper marine, *Colwell-bay, Isle of Wight.*
35. FUSUS LONGÆVUS (VERMIIA CRASSA), London Clay, *Barton.*
36. FUSUS MACILENTUS. EOCENE, *Barton.*
37. FUSUS REGULARIS. SOW : EOCENE, *Barton.*
38. FUSUS ROSTRATUS. EOCENE, *Barton.*
39. LIMNEA GLOBOSULA. EOCENE, *Isle of Wight.*
40. LIMNEA LONGISCATA. EOCENE, *Isle of Wight.*
41. LIMNEA PYRAMIDALIS. EOCENE, *Isle of Wight.*
42. MELANIA LACTEA. EOCENE.
43. MELANOPSIS CARINATUS. EOCENE, *Isle of Wight.*
44. MELANOPSIS FUSIFORMIS. EOCENE, Upper marine, *Headon-hill, Isle of Wight.*

No.

45. NATICA MUTABILIS. EOCENE, Upper marine, *Colwell-bay, Isle of Wight.*
46. NEMATURA PYGMEA. EOCENE, *Isle of Wight.*
47. NEMATURA NERITINA. MIDDLE EOCENE, *Isle of Wight.*
48. NERITINA CONCAVA. EOCENE, *Isle of Wight.*
49. NUCULA DESHAYESII. EOCENE, *Belgium.*
50. NUMMULITES LAVIGATA. EOCENE, *Belgium.*
51. OSTREA. MIDDLE EOCENE, *Colwell-bay, Isle of Wight.*
52. OSTREA TENER. EOCENE, *Isle of Wight.*
53. OLIVA BRANDERI. EOCENE, *Barton.*
54. PALUDINA LENTA. EOCENE, *Colwell bay, Isle of Wight.*
55. PALUDINA THERMALIS. Freshwater Limestone, *Hochst* near *Frankfort.*
56. PHOLADOMYA MARGARITACEA. EOCENE, *Isle of Wight.*
57. PHOLADOMYA MARGARITACEA, London Clay, *Isle of Wight.*
58. PLANORBIS EUOMPHALUS. EOCENE, *Isle of Wight.*
59. PLANORBIS ROTUNDATUS. EOCENE, *Isle of Wight.*
60. PLANORBIS ROTUNDATUS. EOCENE, *Isle of Wight.*
61. PLEUROTOMA ATTENUATA. EOCENE, *Bracklesham.*
62. PLEUROTOMA FILOSA. EOCENE.
63. POTAMIDES. EOCENE, *Isle of Wight.*
64. POTAMIDES MURICATUS. EOCENE, Upper Marine, *Headon-hill. Isle of Wight.*
65. POTAMIDES VENTRICOSUS. SOW : EOCENE. Upper Marine. *Headon-hill. Isle of Wight.*
66. POTAMOMYA PLANA. EOCENE, *Isle of Wight.*
67. PSAMMOBIA COMPRESSA ? EOCENE, *Isle of Wight.*
68. PSAMMOBIA RUGOSA. EOCENE. *Isle of Wight.*
69. PSAMMOBIA RUDIS. SOW : MIDDLE EOCENE, *Isle of Wight.*
70. ROSTELLARIA FISSINELLA. EOCENE.
71. ROSTELLARIA RIMOSA. EOCENE, *Barton.*
72. SANGUINOLARIA HOLLOWAYSII EOCENE, *Bracklesham.*
73. SERAPHS CONVOLUTUS. SOW : EOCENE, *Barton.*
74. STROMBUS BARTONENSIS. EOCENE, *Barton.*
75. TRITON ARGUTUS. SOW : EOCENE, *Barton.*
76. TRITON FLANDRICUM. EOCENE, *Belgium.*
77. TROCHUS MONILIFER. EOCENE, *Barton.*
78. TURRITELLA IMBRICATANA. EOCENE, *Isle of Wight.*
79. TURRITELLA TEREBELLA. EOCENE, *Bracklesham Bay.*
80. UNIO SOLANDRI. EOCENE, *Isle of Wight.*
81. VOLUTA AMBIGUA. EOCENE, *Barton.*

No.

82. VOLUTA LUCTATOR. EOCENE, *Barton.*

83. VOLUTA LIMA. EOCENE, *Barton.*

84. VOLUTA SPINOSA. EOCENE.

85. VENERICARDIA (CARDITA) GLOBOSA. EOCENE, *Barton.*

86. VENUS TENUISTRIATA. EOCENE, *Barton.*

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8. Lower Eocene..	London clay proper of Highgate Hill and Sheppey,—Bognor beds, Sussex, p. 200..... Sables inferieurs, and lits coquilliers of Paris basin, p. 196..... Mottled and plastic clays and sands of the Hampshire and London basins, p. 203..... Sables inferieurs, and argiles plastiques of Paris basin, p. 196..... Nummulitic formation of the Alps, p. 205.....	Fossil shells of the Eocene period, with very few exceptions, extinct. Those which are identified with living species rarely belong to neighbouring regions. All the mammalia of extinct species, and the greater part of them of extinct genera. Plants of Upper Eocene, indicating a south European or Mediterranean climate; those of Lower Eocene, a tropical climate.

87. CASSIDARIA CARINATA. EOCENE, *Highgate.*

88. CERITHIUM. Plastic clay, LOWER EOCENE, *France.*

89. CYRENA CUNEIFORMIS. EOCENE, *Woolwich.*

90. FOSSIL RESIN. EOCENE, *Highgate.*

91. FUSUS. EOCENE, *Highgate.*

92. MELANIA INQUINATA. EOCENE, Plastic clay, *Woolwich.*

93. MELANOPSIS BUCCINOIDES. CYRENA TELLINELLA. COTTON. Plastic clay, *Woolwich.*

94. MODIOLA ELEGANS. EOCENE, *Highgate.*

95. MUREX ASPER. EOCENE, *Highgate.*

96. NAUTILUS CENTRALIS. EOCENE. *Highgate.*

97. NAUTILUS REGALIS. London clay, *Highgate.*

98. NUMMULITES LEVIGATA. EOCENE. *France.*

99. OTODUS OBLIQUUS (tooth of.), London clay, *Sheppey.*

100. OSTREA PULCHRA. LOWER EOCENE, Plastic clay, *Woolwich, Kent.*

101. PECTUNCULUS BREVIROSTRUM. EOCENE, *Bognor.*

102. PETROPHYLLOIDES RICHARDSONI. EOCENE, *Kent.*

103. ROSTELLARIA MACROPTERA. London clay, *Kingston.*

104. TEREDO ANTENAUTA. SOW: EOCENE, *Highgate.*

105. THRACIA OBLATA. EOCENE, *Herne Bay.*

106. PINNA AFFINIS. SOW: EOCENE, London clay, *Bognor.*

107. VERMETUS BOGNORIENSIS. London clay, *Bognor.*

108. VOLUTA NODOSA. EOCENE, *Highgate.*

109. VOLUTA WETHERELLII (rare). EOCENE, *Highgate.*

AQUEOUS ROCKS.

II. SECONDARY.

E. CRETACEOUS.

§ UPPER CRETACEOUS.

Periods and Groups.	*Examples.*	*Observations.*
9 Maestricht beds..	Yellowish white limestone of Maestricht, p. 209..... Coralline limestone of Faxoe, Denmark. p. 210.....	Ammonite, Baculite, and Belemnite, associated with Cypræa, Oliva, Mitra, Trochus &c. Large marine saurians.
10 Upper White Chalk.....	White chalk with flints of North and South Downs,—Surrey and Sussex, p. 211.....	Marine limestone formed in part of decomposed corals.
11 Lower White Chalk.....	Chalk without flints, and chalk marl, ibid.....	
12 Upper Greensand	Loose sand, with bright green particles, ibid..... Firestone of Merstham, Kent, p. 218.... Marlystone, with layers of chert, south of Isle of Wight.....	
13 Gault.....	Dark blue marl at base of chalk escarpment,—Kent and Sussex, p. 218.....	Numerous extinct genera of conchiferous cephalopoda Hamite, Scaphite, Ammonite, &c.

§§ LOWER CRETACEOUS.

14 Lower Greensand	Sand with green matter,—Weald of Kent of Sussex, p. 219..... White, yellowish, and ferruginous sand, with concretions of limestone and chert,—Atherfield, Isle of Wight.... Limestone called Kentish Red.....	Species of shells &c. nearly all distinct from those of Upper Cretaceous ; most of the genera the same.

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9 Maestricht beds..	Yellowish white limestone of Maestricht, p. 209..... Coralline limestone of Faxoe, Denmark, p. 210.....	Ammonite, Baculite, and Belemnite, associated with Cypræa, Oliva Mitra, Trochus &c. Large marine saurians.

No.

1. DITRUPA. Chalk, *Maestricht.*
2. OSTREA. Chalk, *Maestricht.*
3. PAGURUS FAUJASII, DESMAREST. Chalk marl, (*Hanover*) and *Maestricht.*

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10 Upper White Chalk.....	White chalk with flints of North and South Downs,—Surrey and Sussex, p. 211.....	Marine limestone formed in part of decomposed corals.

4. ANANCHYTES OVATUS. Chalk, *Kent.*
5. ANANCHYTES OVATUS. Upper Chalk, *Kent.*
6. BACULITES FAUJASII. Upper Chalk, *Normandy.*
7. BELEMNITES MUCRONATUS. Upper Chalk, *Norfolk.*
8. CIDARIS CLAVIGERA. Chalk, *Bromley,*
9. CIDARIS VESICULOSA. Upper Chalk, *Kent.*

No.

10. CIDARIS VESICULOSA. Upper Chalk, *Kent.*
11. CIDARIS VESICULOSA. Chalk, *Kent.*
12. CONULUS VULGARIS. Chalk, *Kent.*
13. CONULUS SUBROTUNDUS. Chalk, *Kent.*
14. CONULUS SUBROTUNDUS. Upper Chalk, *Kent.*
15. CYPHOSOMA MILLERI. Upper Chalk, *Kent.*
16. HOLASTER PILULA. Chalk, *Sussex.*
17. INOCERAMUS BRONGNIARTII. Chalk, *Sussex.*
18. INOCERAMUS CUVIERI. Upper Chalk, *Kent.*
19. INOCERAMUS. Chalk, *Kent.*
20. MILLEPORA CORYMBOSA. *Caen.*
21. MILLEPORA GLOBULARIS. Chalk, *Kent.*
22. MICRASTER COR-ANGUINUM. Chalk, *Kent.*
23. MICRASTER ROSTRATUS VAR : OF S. COR-ANGUINUM. Chalk, *Kent.*
24. OSTREA SEMIPLANA. Chalk, *Norfolk.*
25. PECTEN 5 COSTATUS. Upper Chalk, *Kent.*
26. PECTEN MEMBRANACEUS, Nilu, Mont. ST. PIERRE, (rare) terre crétace.
27. PTYCHODUS LATIOR OR ALTIOR. Chalk, *Kent.*
28. SERPULA MACROPUS. Chalk, *Kent.*
29. SERPULA. CIPLY near Mons, Chalk.
30. SERPULA. CIPLY near Mons, Chalk.
31. SPONDYLUS SPINOSUS. Upper Chalk. *Sussex.*
32. SPONDYLUS SPINOSUS (PLAGIOSTOMA). Upper Chalk.
33. SPONDYLUS. Upper Chalk.
34. SPONDYLUS. Upper Chalk.
35. TEREBRATULA CARNEA. Sow : Upper Chalk, *Kent.*
36. TEREBRATULA CARNEA. Chalk.
37. TEREBRATULA NERVIENSIS. Chloritic Chalk, *Tournay, Belgium.*
38. TEREBRATULA PLICATULUS. Upper Chalk, *Kent.*
39. TEREBRATULA SEMIGLOBOSA. Chalk, *Kent.*
40. TEREBRATULA SEMIGLOBOSA. Chalk, *Mendon Paris.*
41. VENTRICULITES. Chalk, *Kent.*
42. VENTRICULITES, IN FLINT. Upper Chalk, *Kent.*
43. VENTRICULITES SIMPLEX. Middle Chalk.

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11 Lower White Chalk..... { Chalk without flints, and chalk marl, Surrey and Sussex, p. 211..... }

44. BELEMNITES LANCEOLATUS. Lower Chalk.
45. BELEMNITES DILATATUS. Lower Chalk, *Castellano* (*Basses Alpes.*)

No.

46. BERYX ORNATUS. Lower Chalk, *Kent.*
47. DISCOIDEA SUBUCULUS. Chalk Marl, *Hessia.*
48. FISH, HEAD OF. Lower Chalk, *Cambridge.*
49. GALERITES VULGARIS. Chalk, *Kent.*
50. HOLASTER PLANUS. (SPATANGUS). Lower Chalk, *Kent.*
51. HOLASTER SUBGLOBOSA. (SPATANGUS). Lower Chalk, *Wiltshire.*
52. INOCERAMUS ANNULATUS. Lower Chalk, *Kent.*
53. INOCERAMUS PLANUS. Lower Chalk.
54. OSTREA. Lower Chalk, *Sussex.*
55. PECTEN BEAVERI. Lower Chalk, *Kent.*
56. PECTEN LAMINOSUS. Lower Chalk, *Sussex.*
57. PLICATULA PECTINOIDES. Lower Chalk, *Kent.*
58. SERPULA HELICIFORMIS. Chalk Marl, *Hessia.*
59. SCAPHITES EQUALIS. Lower Chalk.
60. SPHŒRULITES. Cretaceous, *Lisbon.*
61. TEREBRATULA SUBUNDATA. Lower Chalk, *Dorsetshire.*
62. TEREBRATULA SEMIGLOBOSA. Lower Chalk, *Wiltshire* and *Kent.*
63. TURRILITES. Lower Chalk, *Wiltshire.*
64. VENTRICULITES. Lower Chalk, *Kent.*

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12 Upper Greensand { Loose sand, with bright green particles, Surrey and Sussex, p. 211..... Firestone of Merstham, Kent, p. 218.... Marlystone, with layers of chert, south of Isle of Wight..... }

65. ACHILLEUM VOLUTA. Alpine formation.
66. AMMONITES VARICOSUS. Greensand, *Blackdown.*
67. AMMONITES VARICOSUS. Greensand, *Blackdown.*
68. CUCULLEA CARINATA. Upper Greensand, *Blackdown, Devonshire.*
69. CYPRINA ANGULATA. Upper Greensand, *Devizes, Wiltshire.*
70. CYPRINA ANGULATA. Greensand, *Blackdown.*
71. DISCOIDIA SUBUCULUS. Upper Greensand, *Warminster.*
72. EXOGYRA CONICA. Upper Greensand.
73. INOCERAMUS CONCENTRICUS. Upper Greensand, *Blackdown, Devon.*
74. PECTEN QUADRICOSTATUS. Upper Greensand, *Blackdown.*
75. PECTUNCULUS UMBONATUS. Upper Greensand, *Blackdown, Devon.*
76. SIPHONIA PYRIFORMIS. Greensand, *Blackdown.*
77. SPATANGUS CURVIATUS. *Heiliginstadt.*
78. SPONGES.
79. SPONGES. Greensand, *Farringdon.*

No.

80. SPONGES. *Farringdon.*

81. VERMICULARIA CONCAVA. Upper Greensand.

82. VENUS CAPRATA. SOW: Greensand, *Blackdown.*

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13 Gault..... { Dark blue marl at base of chalk escarpment,—Kent and Sussex, p. 218. .... } Numerous extinct genera of conchiferous cephalopoda. Hamite, Scaphite, Ammonite, &c.

83. AMMONITES INFLATUS VAR: Gault, *Cambridge.*

84. AMMONITES BEUDANTII. Gault, *Escragnolles.*

85. AMMONITES SERRATUS. Gault, *Folkstone.*

86. AVICULA GRYPHÆOIDES. Gault, *Cambridge.*

87. DENTALIUM ELLIPTICUM. Gault, *Cambridge.*

88. HAMITES MAXIMUS. Gault, *Folkstone.*

89. INOCERAMUS CONCENTRICUS. Gault, *Kent.*

90. INOCERAMUS SULCATUS, SOW: Gault, *Kent, Folkstone.*

91. PLICATULA PECTINOIDES. Gault, *Cambridge.*

92. SOLARIUM ——— ? Gault, *Cambridge.*

93. SOLARIUM ORNATUM. Gault, *Cambridge.*

94. TEREBRATULA BIPLICATA. Gault, *Cambridge.*

95, TEREBRATULA SULCATA. Park Gault, *Cambridge.*

96. TEREBRATULA OBTUSA. SOW: Gault, *Cambridge.*

97. TROCHOCYATHUS. Gault, *Cambridge.*

98. TROCHOCYATHUS. Gault, *Cambridge.*

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14 Lower Greensand { Sand with green matter,—Weald of Kent and Sussex, p. 219. .... / White, yellowish, and ferruginous sand, with concretions of limestone and chert,—Atherfield, Isle of Wight..... / Limestone called Kentish Red. .. . . . } Species of shells &c. nearly all distinct from those of Upper Cretaceous; most of the genera the same.

ROCKS.

99. CYCLAS LIMESTONE. *Rostenblat* near *Toplitz.*

100. FERRUGINOUS SAND. *Hampstead.*

101. GREENSAND. (IRON SAND) from the *Cave Farnham.*

102. GREENSAND WITH FOSSILS.

103. MARLS. *Southward, Essex.*

104. WHITBY SANDS. *Isle of Wight.*

FOSSILS.

105. ARCA RAULINI. Lower Greensand, *Isle of Wight.*

106. ASTACUS VECTENSIS. Lower Greensand, *Isle of Wight.*

107. ASTACUS VECTENSIS. Lower Greensand, *Isle of Wight.*

No.

108. PANOPŒA PLICATA. Lower Greensand, *Isle of Wight*..
109. TURRITELLA &c. Lower Greensand, *Isle of Wight*.
110. GERVILLIA AVICULOIDES. Lower Greensand.
111. GERVILLIA AVICULOIDES. (TURRITELLA GRANULATA) Greensand, *Blackdown*.
112. GERVILLIA LINGULOIDES. Lower Greensand.
113. NAUTILUS UNDULATUS. Lower Greensand.
114. PECTEN INTERSTRIATUS. Lower Greensand.
115. PANOPŒA PLICATA. Lower Greensand.
116. SERPULÆ. Lower Greensand.
117. TEREBRATULA SELLA. SOW: Lower Greensand.
118. TEREDINA IN WOOD. Lower Greensand, *Maidstone*.
119. THETIS MINOR. Lower Greensand.

F. WEALDEN.

Periods and Groups.	*Examples.*	*Observations.*
13 Wealden Clay....	Clay with occasional bands of limestone,—Weald of Kent, Surrey, and Sussex, p. 227..	Of fresh water origin, shells of pulmoniferous mollusca and of Cypris. Land reptiles.

1. BUFONITES (FISH PALATES). Wealden, *Kent*.
2. CYCLAS MEDIA. Wealden, *Tonbridge wells*.
3. CYPRIS VALDENSIS. Wealden, *Isle of Wight*.
4. CYPRIS VALDENSIS. Wealden.
5. CYPRIS VALDENSIS. Wealden.
6. LONCHOPTERIS MANTELLI. Wealden.
7. UNIO GAULTERI. (CYCLAS MEDIA). Wealden, *Sussex*.
8. UNIO GAULTERI &C. Wealden, *Tonbridge wells*.

G. OOLITE.

Periods and Groups.	*Examples.*	*Observations.*
18 Upper Oolite....	*a*. Portland building stone, p. 259. .... *b*. Portland sand.... .... *c*. Kimmeridge clay, Dorsetshire, p. 260.	
19 Middle Oolite....	*a*. Coral Rag, p. 260. Calcareous freestones, Oolite, often full of Corals. Oxfordshire.... *b*. Oxford clay—Dark blue clay—Oxfordshire and midland counties, p. 263....	Ammonites and Belemnites numerous, Large saurians. as Pterodactyles, Plesiosaurs, Ichthyosaurs.
20 Lower Oolite . .	*a*. Cornbrash and forest marble, Wiltshire, p. 263..... *b*. Great Oolite and Stonesfield slate, Bath, Bradford, Stonesfield near Woodstock, Oxfordshire, p. 266.... *c*. Fuller's earth,—clay containing fuller's earth near Bath, p. 272..... *d*. Inferior Oolite, calcareous freestone, and yellowsands,—Cotteswold Hills, Dundry Hill, near Bristol, p. 272....	No cetaceans yet known, but three species of terrestrial mammalia, p. 267, 268. Preponderance of ganoid fish. The plants chiefly cycads, conifers, and ferns, with a few palms.

No.

18 Upper Oolite.... *a*. Portland building stone, p. 259. .... *b*. Portland sand..... *c*. Kimmeridge clay, Dorsetshire, p. 260. — Ammonites and Belemnites numerous. Large saurians, as Pterodactyles, Plesiosaurs, Ichthyosaurs. No cetaceans yet known, but three species of terrestrial mammalia, p. 267, 268. Preponderance of ganoid fish. The plants chiefly cycads, conifers, and ferns, with a few palms.

ROCKS.

1. IRON OOLITE, *Wirtemberg*.
2. UPPER JURA. Limestone, *Bayreuth*.

FOSSILS.

3. AMMONITES BIPLEX. OOLITE, *Portland*.
4. AXINUS OBSCURUS, *Kimmeridge Clay*.

19 Middle Oolite... *a*. Coral Rag, p. 260. Calcareous freestones. Oolite, often full of Corals. Oxfordshire..... *b*. Oxford clay—Dark blue clay—Oxfordshire and midland counties, p. 262.... — Ammonites and Belemnites numerous. Large saurians, as Pterodactyles, Plesiosaurs, Ichthyosaurus. No cetaceans yet known, but three species of terrestrial mammalia, p. 267, 268. Preponderance of ganoid fish. The plants chiefly cycads, conifers, and ferns, with a few palms.

a. CORAL RAG.

5. ASTREA LIMBATA. Coral Rag, *Nattheim*, *Wurtemberg*.
6. ASTARTE OVATA. Coral Rag, *Wiltshire*.
7. CERIOPORA RADICIFORMIS. Coral Rag, *Engelhardsberg*.
8. CIDARIS BLUMENBACHII. Coral Rag, *Wiltshire*.
9. CIDARIS CRENULARIS. (Hemicidaris,) Coral Rag, *Wiltshire*.
10. CORAL RAG. Malton, *Yorkshire*.
11. LITHODOMUS INCLUSUS. Coral Rag, *Wiltshire*.
12. NUCLEOLITES CLUNICULARIS. Coral Rag, Oolite, *Wiltshire*.
13. PECTEN LEVIS ? SOW : Coral Rag.
14. PENTACIMITES PENTAGONALIS, Coral Rag, *Engelhardsberg*; *Franconia*.
15. TEREBRATULA BIPLICATA. Coral Rag, *Streitberg*.
16. PECOPTERIS TENUIS. Oolite Shale, *Yorkshire*.
17. PTEROPHYLLUM COMPTUM. Oolite, *Yorkshire*.
18. PTEROPHYLLUM COMPTUM. Oolite Shale, *Scarborough*.
19. AMMONITES CALLOVIENSIS. Kelloway Rock, *Wiltshire*.
20. TEREBRATULA ORNITHOCEPHALA. Shewing the arms of, Kelloway, Rock, Oolite, *Wiltshire*.

b. OXFORD CLAY.

21. AMMONITES BRIGHTII. Oxford Clay, *Wiltshire*.
22. AMMONITES COMPTONI. Oxford Clay, *Wiltshire*.
23. AMMONITES COMPTONI. Oxford Clay, *Wiltshire*.
24. AMMONITES ELIZABETHÆ. Oxford Clay, *Wiltshire*.
25. AMMONITES ELIZABETHÆ. Oxford Clay, *Wiltshire*.

No.

26. AMMONITES EXCAVATES. Oxford Clay, *Cambridgeshire.*
27. AMMONITES HECTICUS. Oxford Clay, *Franconia.*
28. AMMONITES LAMBERT. Oxford Clay, *Lannoy, Ardennes.*
29. AMMONITES VERTEBRALIS. Oxford Clay, *Scarborough.*
30. PANOPŒA GIBBOSA. Oxford Clay.
31. ROSTELLARIA. Oxford Clay, *Wiltshire.*

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20 Lower Oolite....	*a.* Cornbrash and forest marble, Wiltshire, p. 263....	Ammonites and Belemnites numerous.
	b. Great Oolite and Stonesfield slate, Bath, Bradford, Stonesfield near Woodstock, Oxfordshire, p. 266.	Large saurians, as Pterodactyles Plesiosaurs, Ichthyosarus.
	c. Fuller's earth—clay containing fuller's earth near Bath, p. 272.....	No cetaceans yet known, but three species of terrestrial mammalia, p. 267, 268 Preponderance of ganoid fish. The plants chiefly cycads, conifers, and ferns. with a few palms.
	d. Inferior Oolite, calcareous freestone, and yellowsand,—Cotteswold Hills, Dundry Hill, near Bristol, p. 272....	

a. CORNBRASH.

32. NUCLEOLITES DEPRESSUS. Cornbrash, *Wiltshire.*
33. OSTREA MARSHII. Cornbrash.
34. TEREBRATULA INTERMEDIA. Cornbrash, *Wiltshire.*
35. TEREBRATULA LAGENALIS. Cornbrash, *Wiltshire.*
36. TEREBRATULA OBOVATA. Cornbrash, *Wiltshire.*

b. GREAT OOLITE.

37. ASTARTE RHOMBOIDALIS. Great Oolite.
38. GERVILLIA ACTUA. Great Oolite, *Collyweston.*
39. MODIOLA IMBRICATA. Great Oolite.
40. TEREBRATULA INTERMEDIA. BROYZON. Great Oolite, *France.*
41. TEREBRATULA MAXILLATA. Great Oolite, *Oxfordshire.*
42. TEREBRATULA ORBICULARIS. Great Oolite, *Wiltshire.*

b. BRADFORD CLAY.

43. APIOCRINUS ROTUNDUS. Bradford Clay, *Wiltshire.*
44. OSTREA COSTATUS. Bradford Clay, *Bavelliers* by *Belfort.*
45. TEREBRATULA COARCTATA. Bradford Clay, *Wiltshire.*

c. FULLERS EARTH.

46. TEREBRATULA ORNITHOCEPHALA. Fullers Earth, *Wiltshire.*
47. TEREBRATULA ORNITHOCEPHALA. Fullers Earth, *Wiltshire.*
48. TEREBRATULA VARIANS. Fullers Earth, *Wiltshire.*

d. INFERIOR OOLITE.

49. AMMONITES PARKINSONI. Inferior Oolite.
50. ASTARTE ELEGANS. Inferior Oolite.
51. ASTARTE ELEGANS. Inferior Oolite, *Bayeux.*
52. ASTARTE MODIOLARIS. Inferior Oolite, *Bridport.*
53. BELEMNITE shewing Alveolus. Inferior Oolite.

No.

54. DISCOIDEA HEMISPHERICA. Inferior Oolite.
55. PLEUROTOMARIA ORNATA. Inferior Oolite, *Bridport.*
56. TEREBRATULA ——— ? Inferior Oolite, *Strand.*
57. TEREBRATULA ANGULATA. Inferior Oolite, *Cheltenham.*
58. TEREBRATULA VULLATA. Inferior Oolite, *Pyrenees.*
59. TEREBRATULA CORNUTA. Marlstone, *Ilminster, Somerset.*
60. TEREBRATULA CYNOCEPHALA. Inferior Oolite, *Glostershire.*
61. TEREBRATULA FIMBRIA. Inferior Oolite, *Glostershire.*
62. TEREBRATULA PEROVALIS. Inferior Oolite, *Cheltenham.*
63. TEREBRATULA SPINOSA. Inferior Oolite, near *Bath.*
64. TEREBRATULA SPHEROIDALIS. Marlstone, *Somerset.*
65. VERMETUS CONCINNUS. Inferior Oolite, *Yorkshire.*

H. LIAS.

21 Lias..... { Argillaceous limestone, marl and clay, —Lyme Regis, Dorsetshire, p. 273. } Mollusca, reptiles, and fish of genera analogous to the Oolite.

ROCKS.

1. LIAS MARL, containing remains of Saurian, *Mistelgau* near *Bayreuth.*
2. LIAS MARL, *Wirtemberg.*
3. LIAS.

FOSSILS.

4. ACHODUS NOBILIS, Lias, *Lyme Regis.*
5. AMMONITE. Lias, Clay Ironstone.
6. AMMONITES BIFRONS. Lias, *Somerset.*
7. AMMONITES BIFRONS ? Lias, *Somerset.*
8. AMMONITES BIRCHII. Section of, Lias, *Lyme.*
9. AMMONITES COSTATUS. Lias, *Banz, Franconia.*
10. AMMONITES WALCOTTI. Lias, *Whitby, Yorkshire.*
11. (AMPHIDESMA) PANOPŒA DONACIFORME. PHILLIPS. Lias, *Lincolnshire.*
12. AVICULA LONGICOSTATA, STUTCHBURY. Loudon's Mag. Nat. Hist. New series vol. 3, p. 163.
13. BELEMNITES DIGITALIS. Lias marl, *Bayreuth.*
14. COPROLITES. Lias, *Lyme Regis.*
15. GRYPHŒA CYMBRIUM. *Goppengen. Wirtemberg.*
16. GRYPHŒA INCURVA. Lias near *Bath.*
17. HYBODUS BECHEI. Lias, *Lyme Regis.*
18. ICHTHYOSAURUS. Lias, *Lyme Regis.*
19. ICHTHYOSAURUS. Teeth of, Lias, *Lyme Regis.*
20. ICHTHYOSAURUS. Paddle of, Lias, *Lyme Regis.*
21. ICHTHYOSAURUS. Part of paddle of, BLUE Lias, *Lyme Regis.*

No.

22. LIMA GIGANTEA. Lias, *Cheltenham.*
23. NUCULA OVUM. Lias, *Lincoln.*
24. OPHIURA EGERTONI. Lias, *Lyme Regis.*
25. OPHIURA. RAY OF, Lias, *Whitby.*
26. PECTEN. Lias, Middle Jura, *Khoraschovs, Moxorr.*
27. PECTEN EQUIVALVIS. SOW: Lias, *Somerset.*
28. SPIRIFER ROSTRATUS. DEBUSH. Lias, *Puyseriem.*
29. TEREBRATULA FURCILLATA. Lias, *Somerset.*
30. TEREBRATULA NUMISMALIS. Lias, *France.*
31. TEREBRATULA TETRAHEDRA. Lias, *Somerset.*

I. TRIAS.

22 Upper Trias.....	Keuper of Germany or variegated marls—Red, grey, green, blue and white marls and sandstone with gypsum—Wirtemberg, bone-bed of Axmouth Dorset, p 289.....	Batrachian reptiles, *e. g.* Labyrinthodon, Rhyncosaurus, &c. Cephalopoda: Ceratites. No Belemnites. Plants. Ferns, Cycads, Conifers.
23 Middle Trias or Muschelkalk...	Compact greyish limestone with beds of dolomite and gypsum.—North of Germany, p 287 (Wanting in England..	With Equisetites and Calamite.
24 Lower Trias....	Variegated or Bunter sandstone of Germany: Red and white spotted sandstone with gypsum and rock salt, p. 288. Part of New Red sandstone of Cheshire with rock salt, p. 294.....	Plants different for the most part from those of the Upper Trias.

22. UPPER TRIAS.

1. NEW RED SANDSTONE, *Sangerhausen.*
2. KEUPER SANDSTONE, *Stuttgardt.*
3. NOTHOSAURUS MIRABILIS. (Trias).

23. MIDDLE TRIAS.

ROCK

4. CRYSTALLINE MUSCHELKALK, *Buidlocherberg* near *Bayreuth.*
5. LOWER MUSCHELKALK. *Wellen balk, Rehebach, Heidelberg.*

FOSSILS.

6. AVICULA SOCIALIS, Mytilus socialis, Superior Muschelkalk, *Lametarberg* near *Bayreuth.*
7. BUCCINUM CORRUGATUM, Muschelsand *Parma.*
8. CYTHERIUM CINCTUM. Muschelsand *Alzei,*
9. CERATODUS GULIELMI. (Trias), Muschelkalk.
10. DRACOSAURUS BRONNII. (Trias), Muschelkalk.
11. ENCRINUS LILLIFORMIS. Muschelkalk (rare) *Germany.*
12. ENCRINUS LILLIFORMIS. Muschelkalk, *Newstadt, Bavaria.*
13. ICHTHYOSAURUS. Fragments of bone of, Keuper, *Hohenhám, Stuttgardt.*
14. LYCOPODIOLITES ARBORENS. Keuper marl with, *Coburg.*
15. LYNODON TRIGONOLITES (VULGARIS.) Superior Muschelkalk, *Bayreuth.*
16. MYACITIS ELONGATUS. Superior Muschelkalk, *Bayreuth.*
17. MYOPHORIA VULGARIS. (Trias), Muschelkalk, *Germany.*

AQUEOUS ROCKS.

IV. PRIMARY.

K. PERMIAN.

Periods and Groups.	*Examples.*	*Observations.*
25 Upper Permian..	Yellow magnesian limestone. Yorkshire and Durham p. 301..... Zechstein of Thuringia, Upper part of Permian beds, Russia....	Organic remains, both animal and vegetable, more allied to primary than to secondary periods
26 Lower Permian.	*a.* Marl slate of Durham and Thuringia. *b.* Lower New Red sandstone of north of England and Rothliegendes of Germany. *a.* and *b.* Lower part of Permian beds, Russia, p. 301....	Thecodont saurians, Heterocercal fish of genus Palæoniscus, &c.

25. UPPER PERMIAN.

ROCKS.

No.

1. BITUMINOUS MARL SLATE. *Eisleben.*
2. CAVERNOUS MAGNESIAN LIMESTONE. *Eisleben.*
3. EARTHY SWINSTONE. *Eisleben.*
4. ZECHSTEIN formation Limestone. Gera, *Thurigina.*

FOSSILS.

5. FENESTELLA VIRGULIFERA. Permian, *Humbleton hill.*
6. PRODUCTUS ACULEATUS. Zechstein marl.

26. LOWER PERMIAN.

7. PECTEN PUSILLUS. Permian, *Durham.*
8. PALÆONISCUS FRIESLEBENI. Permian, *Thuringia.*

L. CARBONIFEROUS.

Periods and Groups.	*Examples.*	*Observations.*
27 Coal measures ..	*a.* Strata of sandstone and shale with beds of coal.—S. Wales and Northumberland, p. 309....	Great thickness of strata of fluvio-marine origin, with beds of coal of vegetable origin, based on soils retaining the roots of trees.
	b. Millstone grit.—S. Wales, Bristol coal-field, Yorkshire, p. 308.	Oldest of known reptiles of Archegosaurus, Sauroid fish.
28 Mountain limestone.	Carboniferous or mountain limestone, with marine shells and corals.... .... Mendip Hills, and many parts of Ireland, p. 340....	Brachiopoda of genus productus. Cephalopoda of genera Cyrtoceras, Goniatite, Orthoceras. Crustaceans of the genus Phillipsia. Crinoidians abundant.

27 Coal measures ..	*a.* Strata of sandstone and shale, with beds, of coal,—S. Wales and Northumberland; p 309....	Great thickness of strata of fluvio-marine origin, with beds of coal of vegetable origin, based on soils retaining the roots of trees.
	b Millstone grit,—S. Wales, Bristol coal-field, Yorkshire, p. 308....	Oldest of known reptilee of Archegosaurus, Sauroid fish.

No.

ROCKS.

1. ANTHRACITE, *Shonfield.*
2. COAL SANDSTONE, *Glasgow.*
3. BROWN COAL SANDSTONE. *Rorschuch, Bodensee.*
4. BITUMINOUS SHALE OR COAL, *Torbane hill, Scotland.* This substance was recently made the subject of trial in the *Scotch* Courts, as to whether it should be considered coal or not.
5. CYCLOPTERIS FLABELLIFORMIS. Ironstone of Coal measures.
6. MEGALICHTHYS HIBBERTI. Coal shale with jaw tooth of the, *Carluke.*
7. MEGALICHTHYS HIBBERTI. Scales of the, *Carluke.*
8. MEGALICHTHYS HIBBERTI. Coal shale with palatial tooth of the, *Carluke.*
9. MEGALICHTHYS HIBBERTI. Portion of the large scale of the, *Carluke, Lanarkshire.*
10. NEUROPTERIS LOSHII. Coal measures, Nodule of Ironstone, *Coalbrooke Dale.*
11. ORBICULA. Coal measures, near *Glasgow.*
12. PECOPTERIS. Coal measures, *Spain.*
13. PECOPTERIS. Coal measures, *Spain.*
14. PECOPTERIS ASPIDIOIDES. Coal measures, *Newcastle.*
15. PECOPTERIS CISTII. Coal measures, *Newcastle.*
16. PECOPTERIS CYATHEA. Coal measures.
17. PECOPTERIS CYATHEA ? Coal measures.
18. PECOPTERIS MILTONI AND NEUROPTERIS spec. Coal measures, *Newcastle.*
19. PECOPTERIS MURICATA. Coal measures, *Durham.*
20. PECOPTERIS PLUMOSA. Coal measures, *Newcastle.*
21. PECOPTERIS POLYMORPHA. Coal measures, *Newcastle.*
22. PECOPTERIS POLYMORPHA. Coal measures, *Newcastle.*
23. PECOPTERIS SERLII. Coal measures, *Newcastle.*
24. PENTREMITES FLORIALIS. Carboniferous, *America.*
25. SIGILLARIA. Coal measures. T. A. K. 1839.
26. SIGILLARIA.
27. SPHENOPTERIS ELEGANS. Coal measures, *Waldenberg.*
28. SPHENOPTERIS TRIFOLIATA. Coal measures, *Newcastle.*
29. TRIGONOCARPUM NÖGGERATHII. Peel Quarry, Wortley. Coal measures, *Lancashire.*

28 Mountain Limestone.....	Carboniferous or mountain limestone, with marine shells and corals..... Mendip Hills, and many parts of Ireland, p. 34e.....	Brachiopoda of genus productus. Cephalopoda of genera Cyrtoceras, Goniatite, Orthoceras. Crustaceans of the genus Phillipsia. Crinoidians abundant.

ROCKS.

No.

30. MOUNTAIN LIMESTONE. *Glasgow.*
31. MOUNTAIN LIMESTONE. Ruppersdorf, *Bohemia.*

FOSSILS.

32. CYATHOCRINITIS RUGOSA. Mountain Limestone, *Carluke.*
33. COCHLIODUS. Mountain Limestone, *Bristol.*
34. ENCRINITIS LIMESTONE.
35. EUOMPHALUS PENTANGULATUS. Carb. Limestone, *Ireland.*
36. NATICOPSIS PHILLIPSII. Carb. Limestone, *Cork, Ireland.*
37. NUCULA. Mountain Limestone, *Carluke.*
38. ORTHIS RESUPINATA. Carb. Limestone, *Derbyshire.*
39. PECTEN GRANOSUS? Carb. Limestone, *Ireland.*
40. PRODUCTUS MARTINI. Mountain Limestone, *Carluke.*
41. SPIRIFER STRIATUS. Carb. Limestone.

M. DEVONIAN.

29 Upper Devonian.	*a.* Yellow sandstone of Dura Den, Fife. *b.* Red sandstone and marl with cornstone of Herefordshire and Forfarshire. Paving and roofing-stone, Forfarshire.. Upper part of Devonian beds of south Devon.....	Tribe of fish with hard coverings like Chelonians, Pteric thys, Pamphractus, &c., also of genera Cephalaspis, Holopsichius, &c. No reptiles yet known.
30 Lower Devonian.	Grey sandstone with Ichthyolite,—Caithness, Cromarty, and Orkney. Lower part of Devonian beds of South Devon, and green chloritic slates of Cornwall, limestone of Gerolstein, Eifel.	Fish, partly of same genera, but of distinct species from those in Upper Devonian; also Osteolepis Coccosteus, Glyptolepis, Dipterus, &c.

29. UPPER DEVONIAN.

1. ASTRŒA. Species Devonian, *Torquay.*
2. ASTRŒA HELIANTHOIDES. Devonian, *Boulogne.*
3. BELLEROPHON. Devonian, *Spain.*
4. CYATHOPHYLLUM CUSPITOSUM. Devonian system, *Bensberg* near *Cologne.*
5. GONIATITIS INTUMESCENS. *Beyrich, Nassau.*
6. PHACOPS LACINIATUS. Devonian, *France.*
7. PTERICTHYS QUADRATUS. Devonian, *Scotland.*
8. SPIRIFER. Devonian, *Spain.*
9. SPIRIFER PELLICO. Devonian, *Spain.*
10. SPIRIFER VERNEUILII, shewing interior. Devonian, *France.*
11. TURRITELLA CORONATA. Devonian superior, *Paffrath.*
12. TRIGINOTRELA OSTEOLATA. Devonian superior, *Gerolstein.*

No.

30. LOWER DEVONIAN.

13. CALCEOLA SANDALINA. Devonian, *Eifel.*
14. CLYMENIA LEVIGATA. Devonian, *Eifel.*
15. COCCOSTEUS. Devonian, *Scotland.*
16. FENESTELLA ANTIQUA. Devonian, *Cornwall.*
17. HOMALONOTUS DELPHINOCEPHALUS. Devonian, *Eifel.*
18. MACROCHEILUS ARCULATUS. Devonian, *Eifel.*
19. MEGALODON CUCULLATUS. Devonian, *Eifel.*
20. ORTHIS. Devonian, *Eifel.*
21. OSTEOLEPIS. Devonian.
22. OSTEOLEPIS. Devonian, *Scotland.*
23. OSTEOLEPIS MAJOR. Devonian, *Scotland.*
24. PHACOPS MACROPTHALMUS. Devonian, *Eifel.*
25. SPIRIFER CANALIFERA. S. OSTIOLATA ? Devonian, *Eifel.*
26. SPIRIFER VERNEULLI. Devonian.
27. ———— ? Devonian.
28. STRIGOCEPHALUS BURTINI. Devonian, *Eifel.*
29. TEREBRATULA ASPERA. Devonian, *Eifel.*
30. TEREBRATULA CONCENTRICA. Devonian, *Eifel.*
31. TEREBRATULA FERITA AND SPIRIFER HETEROCLYTUS. Devonian, *Eifel.*
32. TEREBRATULA RETICULARIS, VAR : aspera. Devonian, *Eifel.*

N. SILURIAN.

31 Upper Silurian..	*a.* Tilestone of Brecon and Cærmarthen.	Oldest of fossil fish yet discovered.
	b. Limestone and shale, Ludlow, Shropshire	Trilobites and Graptolites abundant. Brachiopoda very numerous.
	c. Wenlock or Dudley limestone	Cephalopoda ; Bellerophon, Orthoceras.
32 Lower Silurian..	*a.* Caradoc sandstone, Cær Caradoc, Shropshire	Same genera of invertebrate animals as in Upper Silurian, but species chiefly distinct Trinucleus : Caractaci, Cystideæ, p. 358.
	b. Landeilo flags, calcareous flags and schists,—Builth, Radnorshire, Llandeilo, Cærmarthenshire	No land plants yet known. Foot prints of tortoise, see note, p. 360.

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31 Upper Silurian..	*a.* Tilestone of Brecon and Cærmarthen.	Oldest of fossil fish yet discovered.
	b. Limestone and shale, Ludlow. Shropshire	Trilobites and Graptolites abundant. Brachiopoda very numerous.
	c. Wenlock or Dudley limestone	Cephalopoda: Bellerophon, Orthoceras.

1. SILURIAN SANDSTONE. *Wessela* near *Beraun.*
2. ATRYPA GALEATA. *Hurst hill,* near *Dudley.*
3. ATRYPA TEREBRATULA. Lineata. *Tournay, Belgium. Devon.*
4. CALAMOPORA SPONGITIS. Silurian Rock. *Bensburg* near *Cologne.*
5. CELLEPORA, MADREPORA, RETIPORA, ENCRINITES.

No.

6. CALYMENE BLUMENBACHII. Head of, Silurian, *Dudley*.
7. CORALS from *Dudley*. LIMARIA CLATHRATA. Silurian.
8. CORALS. Upper Silurian, *Wenlock*.
9. CYSTIPHYLLUM SILURIENSE. Upper Silurian, *Dudley*.
10. EUOMPHALUS FUNATUS. *Dudley*, 1837. Dr. M.
11. EUOMPHALUS FUNATUS, t. 17-20.
12. GRAPTOLITES LEVIGATUS. Silurian, *Bohemia*.
13. GRYPHEA GLOBOSA (OSTREA). Baculite Limestone.
14. ORTHIS HYBRIDA. Silurian, *Dudley*.
15. PENTAMERUS KNIGHTII. Aymestrey Limestone, *Sedgeley*.
16. PHACOPS CAUDATUS. Aymestrey Limestone, *Sedgeley*.
17. PENTAMERUS KNIGHTII. Aymestrey Limestone, *Sedgeley*.
18. STROMATOPORA CONCENTRICA. Silurian, *Dudley*.
19. SPIRIFER BILOBA. Silurian, *Dudley*.
20. TEREBRATULA SUBLEPIDA. Silurian, *Dudley*.
21. TEREBRATULA RETICULARIS. Silurian, *Dudley*.

32 Lower Silurian.. { *a*. Caradoc sandstone, Cær Caradoc, Shropshire..... } Same genera of invertebrate animals as in Upper Silurian, but species chiefly distinct Trinucleus caractaci, Cystideæ, p. 358. No land plants yet known. Foot prints of tortoise, see note, p.360
{ *b*. Llandeilo flags, calcareous flags and schists,—Builth, Radnorshire, Llandeilo, Cærmarthenshire..... }

22. AGNOSTUS PISIFORMIS. Silurian, *Sweden*.
23. ASAPHUS EXPANSUS. Silurian, *Russia*.
24. ASAPHUS RANICEPS. Silurian, *Russia*.
25. ATRYPA GALEATA. *Hurst hill*, near *Dudley*.
26. GRAPTOLITHUS. Lower Silurian, *Scotland, Hurtfell, Dumfrieshire*.
27. OGYGIA BUCHII. Lower Silurian, *Cambrian of Sedgwick*.
28. ORTHIS BIFORATUS. Silurian, *America*.

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